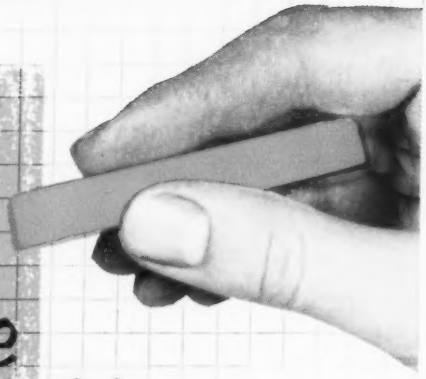
SOAP AND CHEMICAL SPECIALTIES

JULY 1960

Jean Despres, executive vice-president of Coty, Inc., New York, was elected president of the Toilet Goods Assn. at 25th annual meeting, last month. He succeeds A. E. Johnson of Colgate-Palmolive.

IN THIS ISSUE



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When you start with a more reactive material like Solvay® Caustic Potash, you usually get better results. Many users prefer it to caustic soda because it enables them to produce more soluble reaction products and less viscous solutions.

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☐ New Technical Bulletin 15, Caustic Potash

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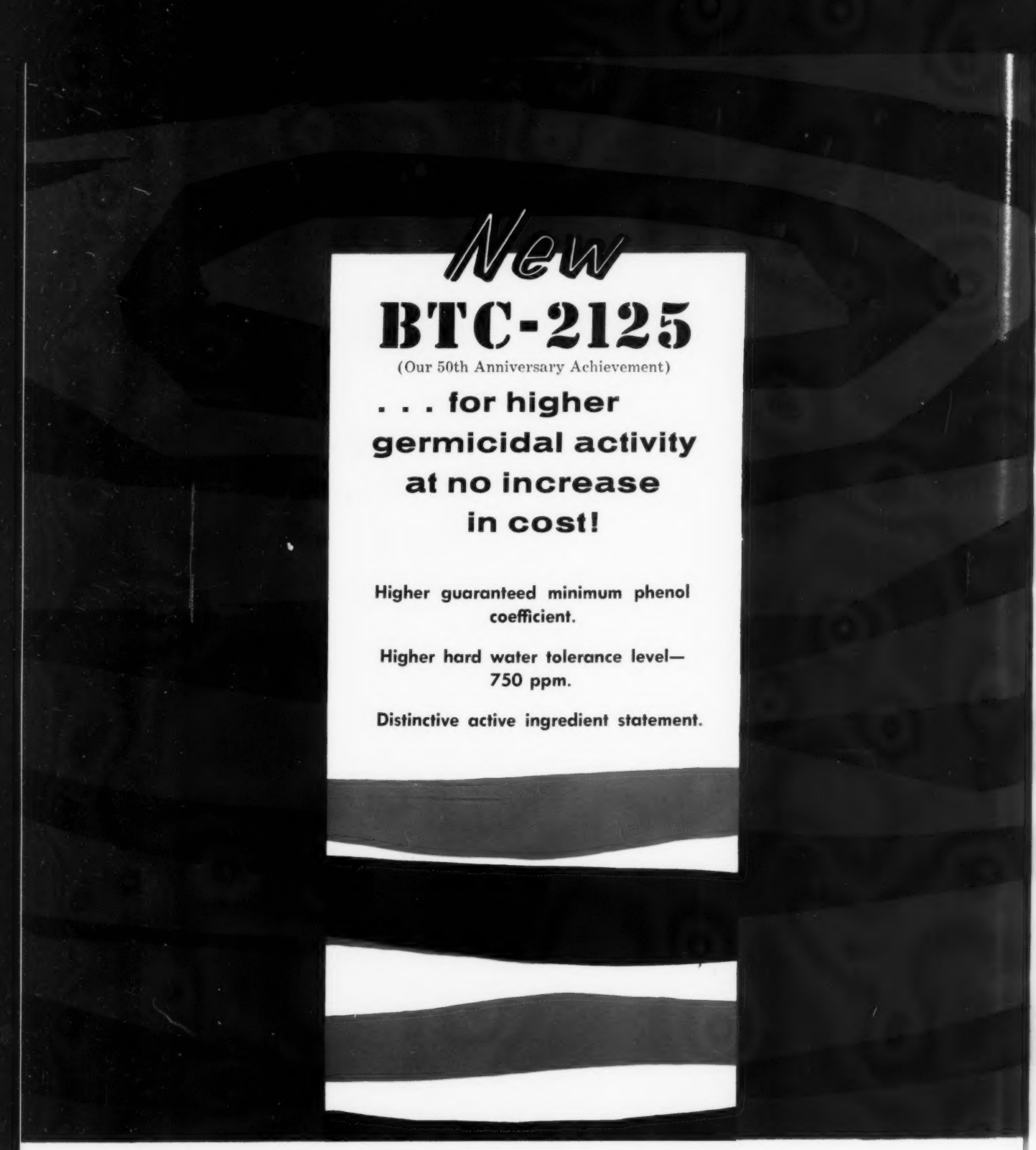

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Volume XXXVI, No. 7, July, 1960

Cover photo: Jean Despres, executive vice-president of Coty, Inc., New York, was elected president of the Toilet Goods Assn., at 25th annual meeting at Poland Spring, Me., June 27. Long active in affairs of TGA, he served last year as vice-president. Further details on meeting appear on page 22 of this issue.

IN THIS ISSUE

FRANK J. REILLY
Editor

CHARLOTTE HAAS
Associate Editor

EDWARD BLOCH
News Editor

THOMAS MORGAN
Advertising Manager

ALVIN PLOFSKY
Production Manager

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Frequent damp mopping or wet traffic can make water resistance very important. Overdoing this quality when no problem exists out of the ordinary, simply increases the difficulty of complete removal or applying multiple coats. Removability must be considered as important as water-resistance under most normal conditions.

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CANDI-CLEAN all surface—all synthetic CLEANER— This is an all synthetic and all purpose surface cleaner with free rinse and free wipe off qualities. Furnished in several colors and odors, and properly priced. Available in two concentrations for resale and in concentrated form for dilution with water for local packaging.

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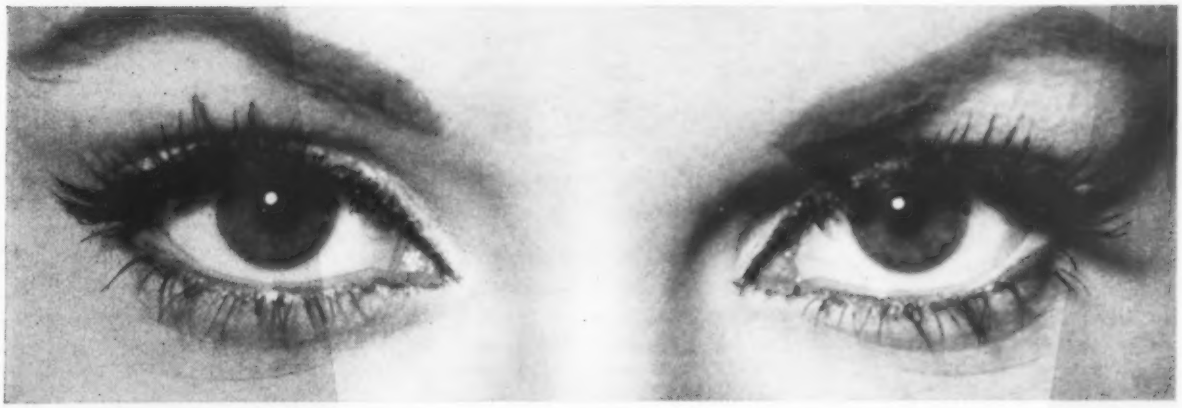
maypons

anionic protein-based detergents



mild to the eyes and skin

Intriguing eyes, aren't they? Certainly be a shame to irritate them with any harsh surfactant. Stepan's Maypons (anionic protein-based detergents) are intriguing too. They are outstanding as detergents, foaming agents and emulsifiers and meet the Draize-Woodward Eye Irritation Test at all concentrations. Perfect for shampoos, cold waves, bath preparations, creams, lotions, etc. . . . any product used on or near eyes and skin.

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427 W. Randolph St., Chicago 6, Illinois

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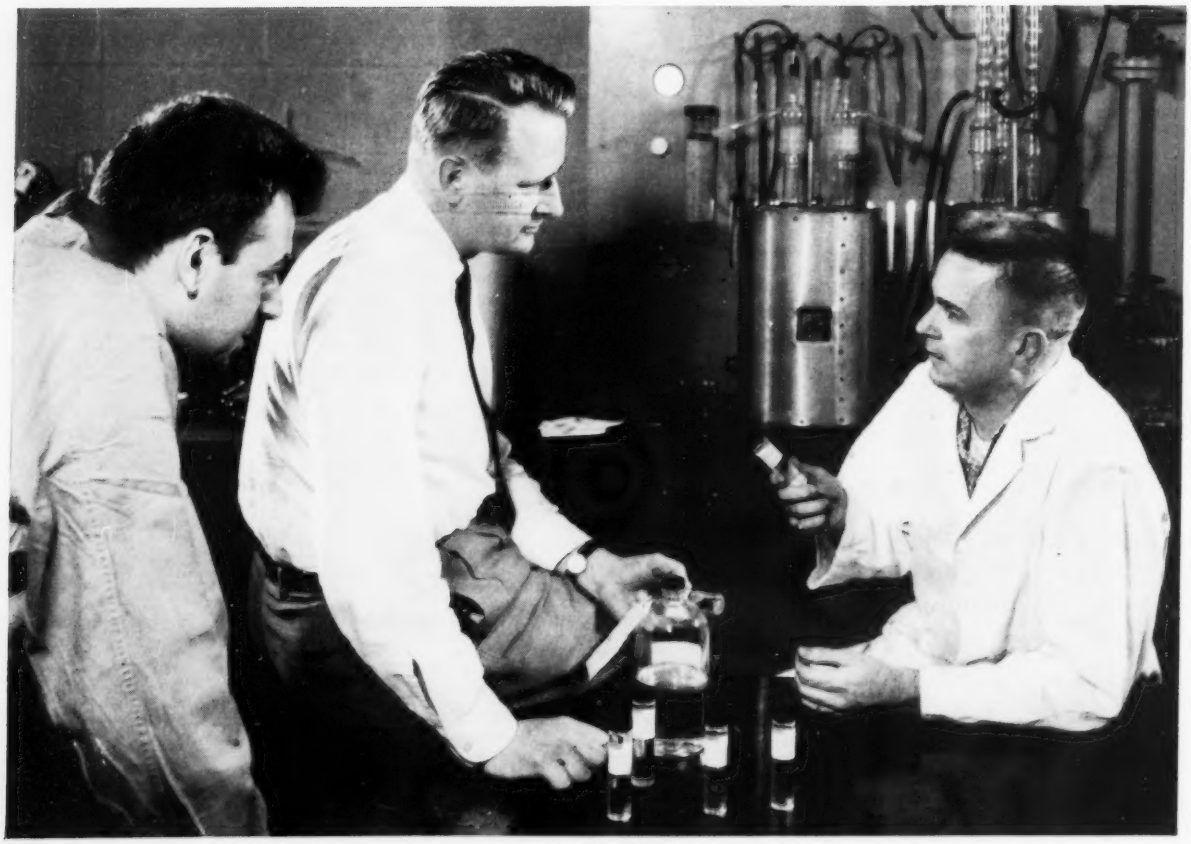

TECHNICAL SERVICE. Emery's Development and Service Department is well equipped and ready to consult on your special problems. With 120 years of industry experience backed by the excellent staff of the Emery Research Laboratories, we may be able to help you improve your product or reduce your costs.

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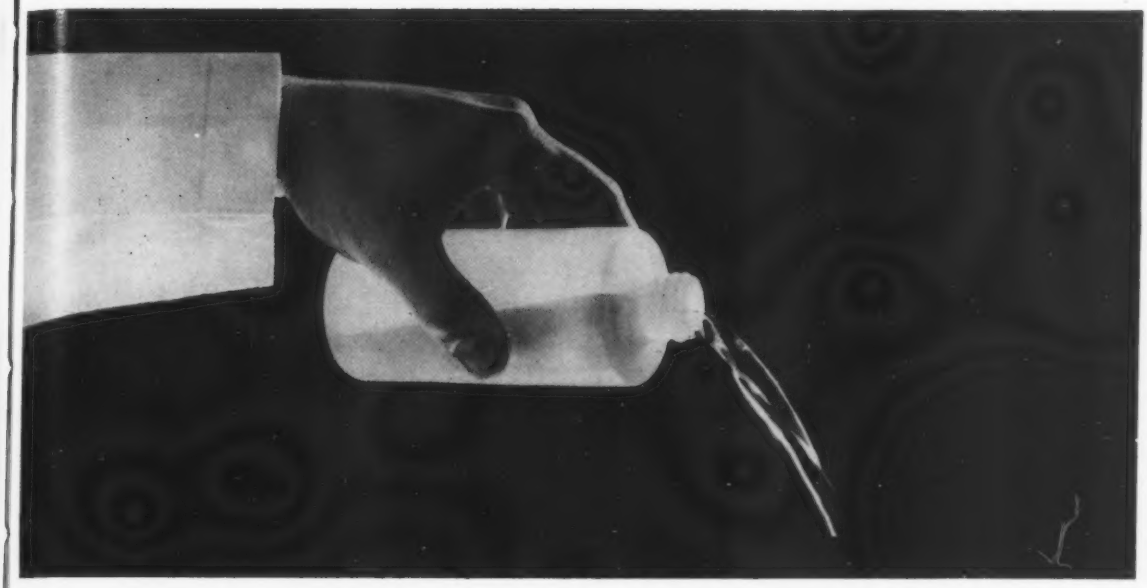

HOUSEHOLD CHORES ARE EASIER with today's harder-working liquid detergents and Ultra's superamides give them longer-lasting foams with improved performance. Ultrapole® LDA is particularly useful as a foam stabilizer and viscosity modifier in dishtergents. And, in cosmetics and shampoos, Ultra's alkanolamine condensates are ideal thickening agents and foam stabilizers.

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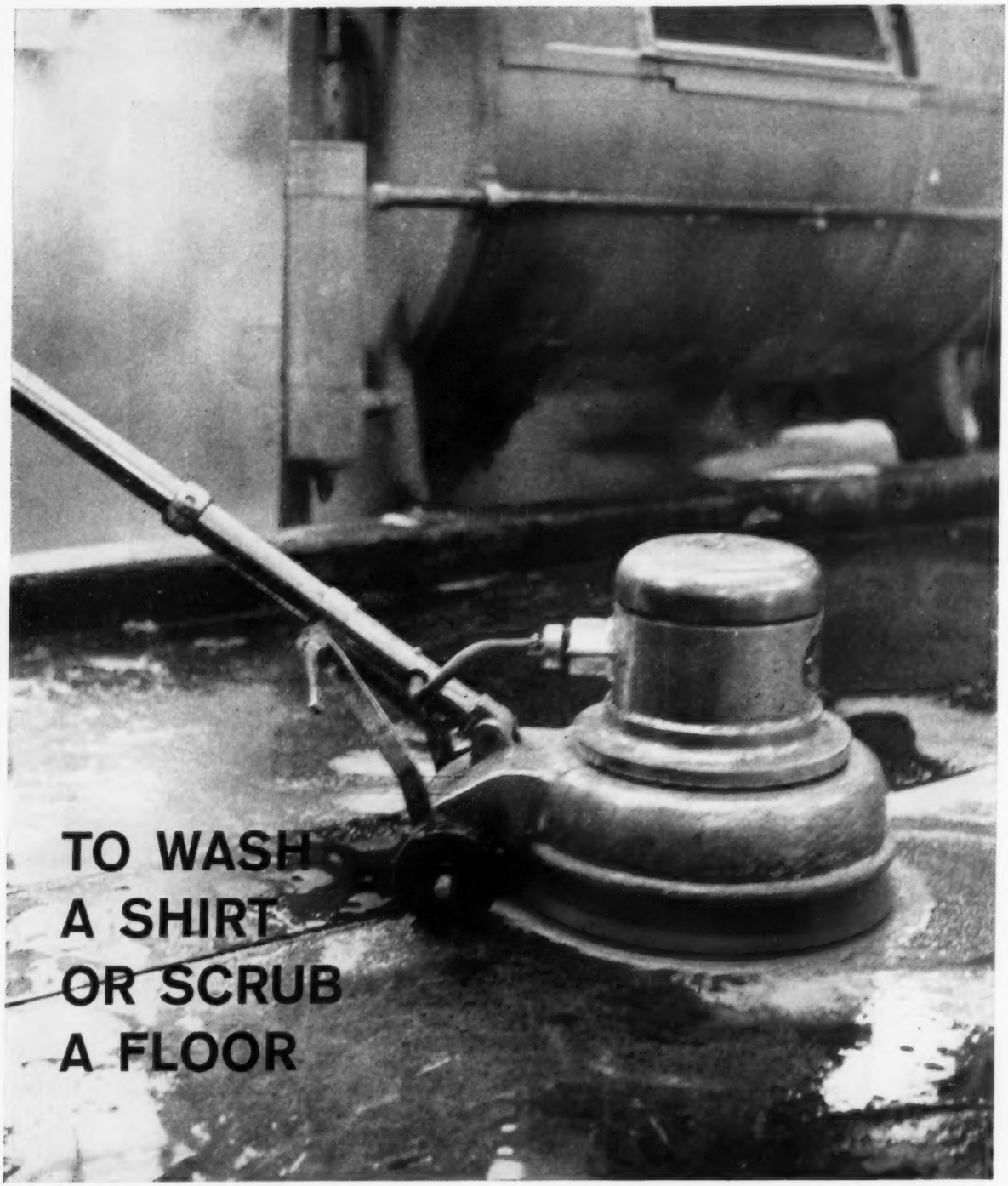

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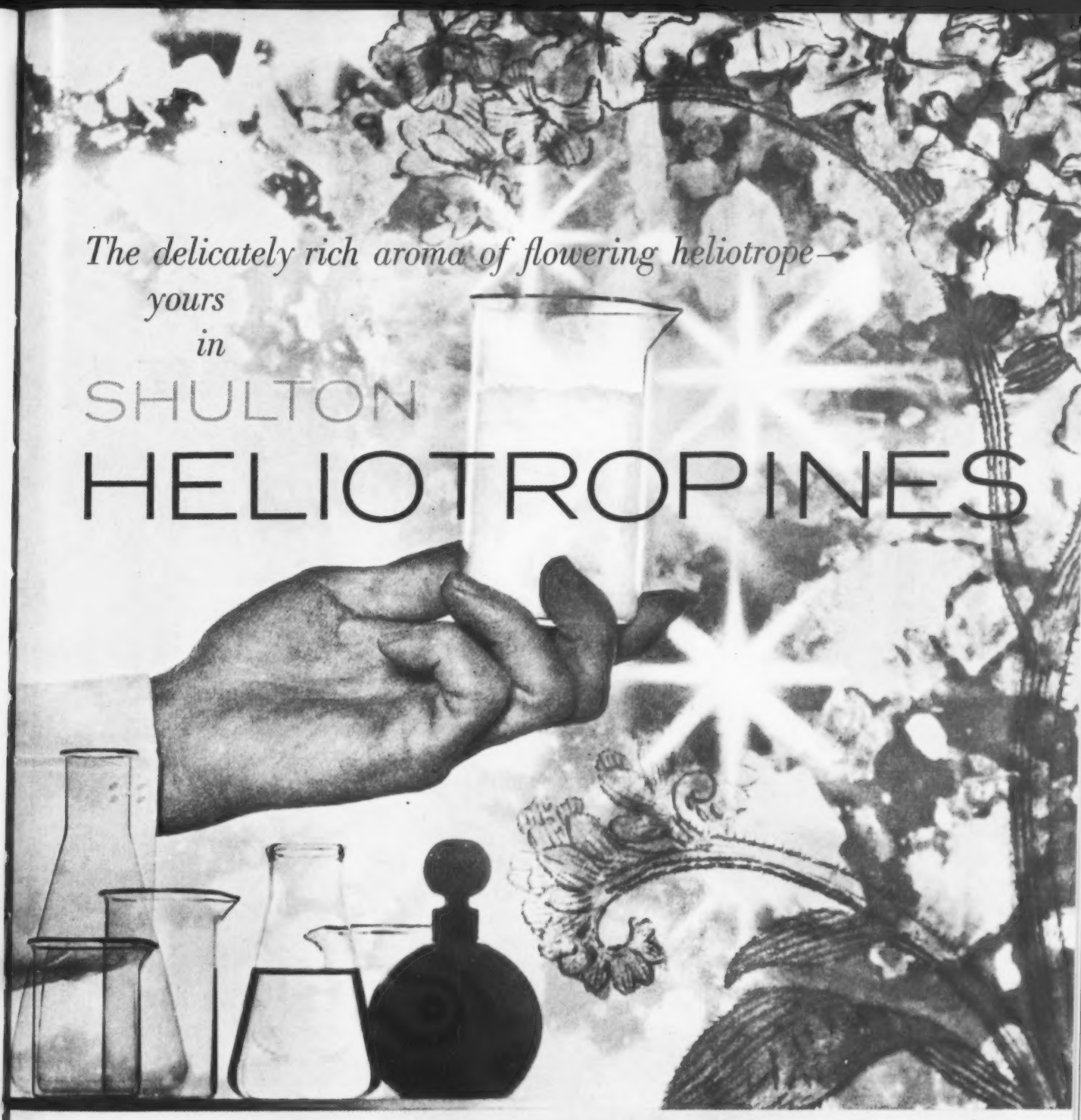

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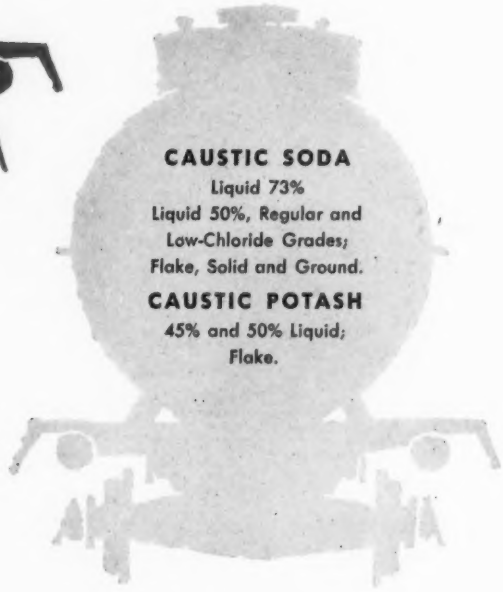

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ARMOUR INDUSTRIAL CHEMICAL COMPANY

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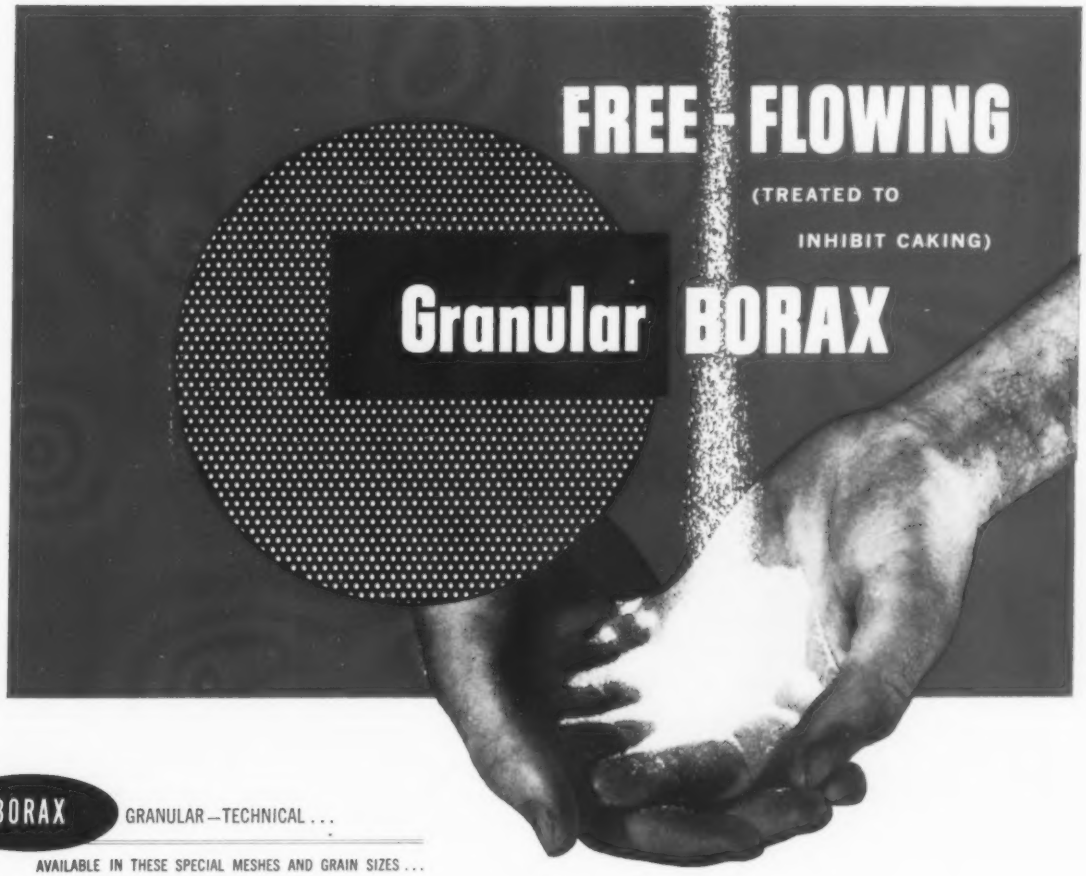

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Name & Screen Designation	Typical Particle Size Range U. S. Standard Sieve No.		Screen Specification U. S. Standard Sieve No. When Packed	
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Granular 8/60 (Special Mesh)	+ 8 + 60	Nil 80.0%	+ 8 +100	none min. 90%
Granular 30/60 (Special Mesh)	+ 30 + 60	0.5% 69.8%	+ 30 +100	max. 1% min. 80%
Granular 30/70 (Special Mesh)	+ 30 + 70	0.3% 71.0%	+ 30 + 40	max. 1% max. 20%
Granular 30/80 (Special Mesh)	+ 30 + 80	0.8% 76.6%	+ 30	max. 1%
Granular 30/100 (Special Mesh)	+ 30 +100	Nil 86.7%	+ 35 +100	none min. 85%
Granular 40/100 (Special Mesh)	+ 40 +100	Nil 89.0%	+ 40 +100	max. 0.5% min. 88%
Granular 40/140 (Special Mesh)	+ 40 +140	0.1% 88.8%	+ 35 +100	none min. 50%
Granular 40/200 (Special Mesh)	+ 40 +200	0.1% 84.1%	+ 30	none
Granular 60/200 (Special Mesh)	+ 60 +200	0.1% 66.7%	+ 60	max. 1%
Granular 80/200 (Special Mesh)	+ 80 +200	2.0% 67.6%	+ 60 + 80	none max. 5%

Powdered Hand Soaps are better performers when borax is part of their make-up. They work better in any water — cut grease quicker — and feel smoother. Our granular borax is free-flowing and 100% soluble. This material is now available to you in any of the many special uniform meshes listed at left. Samples, bulletins, or technical advice can be obtained from the sales office nearest to you. Write today!

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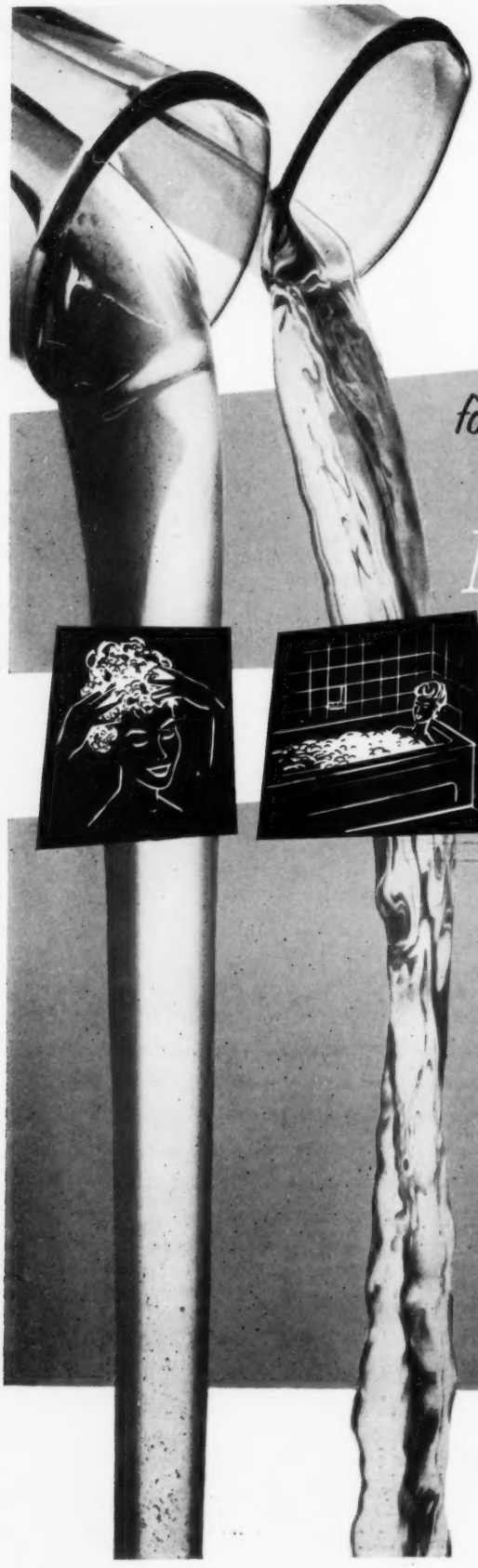

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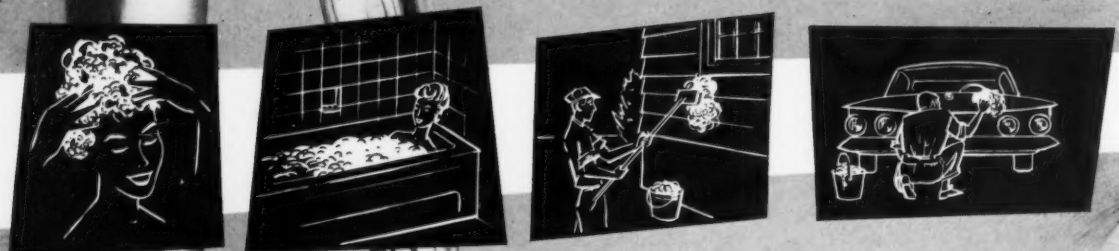

full bodied **Nacconol 60 S**

free flowing **Nacconol SL**

A wide variety of shampoos, bubble baths, car washes and other household and industrial cleaners look better and *are* better when they're based on one of these alkyl aryl sulfonates.

NACCONOL SL has 35% active organic content. For a more concentrated, 60% solids material, NACCONOL 60S is recommended.

Both are homogeneous liquids with pale yellow color and clean, fresh smell. Both will remain clear and pourable even below 32°F. They offer exceptional foaming, wetting and detergent action, are stable to strongly acid or alkaline aqueous solutions and are compatible with anionic and non-ionic materials.

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Nacconol DBX	Nacconol HG	Nacconol Z	Nacconol SW

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Allied Chemical

AFTER CLOSING---

P&G Told to Sell Clorox Chemical Co.

PROCTER & Gamble Co., Cincinnati, was ordered July 10 to dispose of Clorox Chemical Co., Oakland, Calif., household liquid bleach maker.

A Federal Trade Commission examiner, Everett F. Haycraft, ruled that acquisition of Clorox by P & G in August 1957, violated the Clayton Act, by tending to curb competition, and create a monopoly. The order requires that P & G dispose of all Clorox assets, including those acquired since 1957, to restore the previously existing competitive balance. The order is subject to review by the F.T.C., or may be appealed or stayed.

Commenting on the ruling, Howard J. Morgens, president of P & G, said: "This is a preliminary decision, and we will, of course, appeal it to the entire Commission. We are confident that the ultimate decision will sustain the company's contention that it has not violated the Clayton Act or any other law of the United States by the acquisition of the assets of Clorox Chemical Co.

"There is ample evidence that competition in the entire household bleach industry has actually increased since P & G acquired Clorox. New forms of bleach have appeared; at least one powerful new manufacturer has entered the field, and another has announced intention to do so; in addition, retail grocery organizations have introduced their own private brands of bleach. Clorox's share of the total household bleach market is, in fact, no larger today than it was at the time of the acquisition.

"We believe the entire record fully supports our position that competition in the liquid bleach industry has certainly not been lessened by this acquisition, and that there is no reasonable probability that such acquisition will lessen competition in the future."

—★—

Curtis Record Profits

Helene Curtis Industries, Inc., Chicago, recently announced record profits and sales for the quarter ended May 31. Net earnings rose to $676,573, or 34 cents a share, from $450,985, or 35 cents a share, in the same period last year. Sales jumped to $12,938,246, a rise of 17%, from $11,010,078 a year ago.

—★—

Hillyard Branch Expands

Construction of a new branch office building adjoining an existing plant and warehouse at San Jose, Calif., was announced recently by Hillyard Sales Co., St. Joseph, Mo. The new structure houses an area of over 6,000 square feet, to be allocated to general sales offices, sales conference rooms and warehouse department offices, according to Walter S. Hillyard, president.

Hillyard Chemical Co.'s floor treatment and building maintenance products are marketed west of the Mississippi River by Hillyard Sales Co. (Western), in the East by Hillyard Sales Co., (Eastern). The three organizations are headquartered in St. Joseph, Mo.

—★—

Rohrer Named Manager

Appointment of William M. Rohrer as assistant sales manager of agricultural chemicals of the Davidson Chemical division of W. R. Grace & Co., Baltimore, was recently announced by D. N. Hauseman, vice-president of Davidson. He reports to William Caspari, Jr., general sales manager of agricultural chemicals.

After holding various posts in corporate research at Grace, Mr. Rohrer went first to Naco Fertilizer Co., and then Thurston Chemical Co., as purchasing director. He came to Davidson in 1954 and was first in purchasing, later in domestic sales of triple superphosphate and export sales of agricultural chemicals before he assumed his present post.

—★—

Detergent Symposia

Chemical Specialties Manufacturers Association recently announced compilation of the "Symposium on Surfactants" issued since May, 1957, by its Detergents and Cleaning Compounds Division. The book contains symposia on the following subjects: ethylene oxide-based surface active agents; analytical methods for surfactants; use of anionic surface active agents; and nitrogen-containing surfactants.

New branch office building of Hillyard Sales Co. in San Jose, Calif.

Cost is $2.00 per copy, postpaid; $1.50 plus postage in quantities of 100 or more. Address requests for copies to CSMA, 50 E. 41st St., New York 17, N. Y.

—★—

In Pharma-Craft Post

Pharma-Craft Co., New York, maker of toiletries and pharmaceutical specialties, recently announced appointment of Mauri Edwards as general sales manager.

Mr. Edwards was formerly marketing assistant to the scientific director of Joseph E. Seagram & Sons, Inc., the parent company, and he has also served as the public relations director for Pharma-Craft.

—★—

Eastman Sales Head

John H. Sanders has been named sales manager of the Chemicals Division of Eastman Chemical Products, Inc., Kingsport, Tenn., it was announced late last month. He succeeds Guy A. Kirton, who will concentrate on international sales of Tennessee and Texas Eastman Products. Eastman Chemical Products, Inc., is the marketing subsidiary in the United States and Canada for products manufactured by the Tennessee and Texas Eastman company divisions of Eastman Kodak Co.

Mr. Sanders, a graduate chemical engineer, first came to Eastman in 1946. At the time of his advancement, he was a regional sales manager in the chemical sales division, Cleveland.

John H. Sanders

Giraudi Ultra Vice-Pres.

Dr. Carlo Giraudi was advanced to vice-president and technical director of Ultra Chemical

Carlo Giraudi

Works, Inc., Paterson, N. J., it was recently announced. Ultra is a wholly owned subsidiary of Witco Chemical Co. manufacturing detergent products for industrial and consumer applications.

Dr. Giraudi joined Ultra in 1950, holding several posts before his present one. He is in charge of Ultra's research, engineering, and technical services staff.

—★—

Curtis Buys Studio Girl

Acquisition of Studio Girl-Hollywood, Inc., and the assets of Studio Girl of California, both of Los Angeles, was recently announced by Helene Curtis Industries, Inc., Chicago cosmetic and toiletries firm. The acquisition was made for cash, but Curtis did not disclose the amount.

The two Studio Girl firms sell cosmetics house-to-house.

—★—

Heads Carter Research

Irving Reich was recently named director of proprietary research for Carter Products, Inc., New Brunswick, N. J.

Dr. Reich is the developer of "Rise," the first aerosol shaving cream, and holds the basic patent in the field. He also originated a process for extracting sesamin, an insecticidal synergist, from sesame oil.

He was research group director at Foster D. Snell, Inc., from 1944-1951. For the next two years he was a research fellow at the University of Southern California. He joined Lever Brothers in 1953, and most recently was chief of the physics and physical chemistry section at the Lever research center. Dr. Reich served as a consultant to Carter from 1954-1958.

—★—

Can Strike Ends

A five-month strike against Commercial Can Co., Newark, N. J. was recently settled by a vote of the Teamsters Union to accept a new contract with U. S. Hoffman Machinery Corp., New York.

Results of the favorable voting by members of local 810 were announced at the three Hoffman plants involved, Atlas Can Corp. and Fein Can Corp., and Commercial Can Corp., all of Brooklyn. The strike at the Brooklyn plants lasted more than seven months. The new contract calls for hourly pay rises to be staggered over a three-year period.

—★—

Black Cowles Manager

Frank F. Black was recently appointed general manager of the newly created chemical division of Cowles Chemical Co., Cleveland. Mr. Black was formerly manager of organic chemicals department.

The new division results from the merging of the heavy chemicals department, handling bulk inorganic chemicals, with the organic chemicals department.

Frank F. Black

Bright Receives Award

Dr. Willard M. Bright, research and development vice-president for Lever Brothers Co., New

Willard M. Bright

York, received the University of Toledo alumni association gold "T" award as the outstanding alumnus of the year.

Dr. Bright graduated with a B. S. in chemistry from the University in 1936, and with an M. S. in 1937. From Harvard in 1941 he received an A. M. and a Ph.D. in 1942.

He spent 10 years with Kendall Co. in several research positions before joining Lever in 1952 as assistant research director. He was advanced to research and development director in 1954, and in March of this year was elected to his present post.

—★—

New Hostachem Office

Hostachem Corp., Mountainside, N. J., a distributor for Farbwerke Hoechst AG., West Germany, recently announced the opening of its new Chicago office: Board of Trade Building, 141 West Jackson Blvd., Suite 4010-17, Chicago 4, Ill. E. O. Rohardt has been appointed manager.

—★—

New Tower Brochure

Tower Iron Works, Providence, R. I., manufacturers of a complete line of processing equipment, recently announced publication of a new brochure on ribbon blenders.

Intended as a buying guide for the processing industry, describing Tower's line of ribbon blenders, it gives all capacities and dimensions as well as a description of Tower's automated control and new "Tri-mix" action. The brochure is available by writing to Tower Iron Works, 50 Borden St., Providence, R. I.

—★—

FMC Chemicals Catalog

Food Machinery and Chemical Corp., New York, recently announced the availability of a catalog of its chemical products, entitled, "FMC Chemicals." The 36-page, two-color brochure lists all FMC chemicals alphabetically, with physical data and uses. A supplementary listing highlights the major fields of use of the chemicals.

FMC's chemical divisions are Becco, Chemicals & Plastics, Chlor-Alkali, Mineral Products and Niagara. Copies of the catalog can be obtained by writing to FMC, at 161 E. 42nd St., New York 17, N. Y.

—★—

Hall to Davies-Young

Late last month Davies-Young Soap Co. of Dayton, O., announced the appointment of John E. Hall as sales promotional representative. He is a Marquette University graduate, and served with the U. S. Navy in World War II. Mr. Hall will work closely with authorized distributors in Wisconsin and northern Illinois to assist in the sales promotion of "Buckeye" products.

John E. Hall

Lachner to Revlon

Marshall S. Lachner was appointed senior vice president of Revlon, Inc., New York, cosmetic

Marshall S. Lachner

manufacturer, it was recently announced by Charles Revson, president. Mr. Lachner was formerly president of B. T. Babbitt, Inc., New York, household cleaner manufacturer. His appointment is effective July 18.

—★—

Lueders Names Three Execs.

George Lueders & Co., Inc., New York, importer-exporter and manufacturer of essential oils, recently announced three new appointments: George F. Weber, secretary; Louis M. Allstadt, assistant secretary; and Joseph R. Dominica, member of the board of directors.

—★—

Revlon Advertising Head

Revlon, Inc., New York, recently announced that Theodore G. Bergmann has become vice-president of advertising. He succeeded Evan William Mandel who became assistant to the president.

Mr. Bergmann is responsible for all Revlon advertising in television, radio, newspapers, and magazines. An advertising executive since 1947, he was president of Parkson Advertising Agency, Inc., at the time of his appointment. He will continue in this position. At Parkson he has been responsible for the advertising activities of J. B. Williams Co., manufacturer of toiletries and proprietary medicines.

TGA Meets in Maine, Elects Despres Pres.

IN addition to Jean Despres, executive vice-president of Coty, Inc., New York, who was elected president of the Toilet Goods Assn. for the coming year, George L. Schultz, president of Shulton, Inc., Clifton, N. J., was elected a vice-president of the association during its 25th annual meeting, held June 27-29, at Poland Spring, Me.

Re-elected vice-presidents were Oscar Kolin, Helena Rubinstein, Inc.; J. I. Poses, D'Orsay Sales Co., and D. H. Williams, Sterling Drug, Inc., all of New York.

Other officers, both re-elected are Philip C. Smith, Yardley of London, Inc., New York, treasurer, and William F. Denney, Jr., Frances Denney, New York.

New directors elected at the meeting include Hal Grafer, vice-president in charge of marketing, J. B. Williams Co.; Paul J. Martinot, vice-president of Caron Corp., L. W. Schleuse, president, Texas Pharmacal Co., and Raymond Stetzer, vice-president in charge of research for Revlon, Inc. Newly elected to represent associate members on the board is Daniel Reheis, president of Reheis Co.

Other directors re-elected were Edward J. Breck, John H. Breck, Inc.; Paul J. Carey, Tussy Cosmetics; Lessing L. Kole, Kolmar Laboratories, Inc.; Jerome A. Straka, Chesebrough-Ponds, Inc.; Northam Warren, Jr., Northam Warren Corp., all of whose terms expire in 1963.

J. S. Wiedhopf, Roure-Dupont, Inc., was reelected a director representing associate members.

Winner of the Cecil Smith Memorial Trophy of the 10th annual toilet goods industry golf tournament, held June 28, was Fred W. Webster, International Flavors & Fragrances, Inc. Charles A. Pennock, Parfums, Ciro, Inc., won the B. M. Douglas Memorial Golf Trophy; G. Peter Danco, of Ansbacher-Siegle Corp., was the winner of the B. E. Levy Memorial Golf Trophy. Carleton C. Dilatush, Armstrong Cork Co., won the Maple Leaf Trophy given annually by the Toilet Goods Manufacturers Association of Canada. First low gross winner was George E. Davidson, Art Decorating Co.

Full details of the meeting will appear in the August issue.

—★—

Hazardous Substances Law

President Eisenhower on July 12 signed the Federal Hazardous Substances Labeling Act, which on June 28 was passed in the U. S. Senate. The House of Representatives passed the bill earlier this spring. The Senate version, S. 1283, virtually identical with the House version, covers poisonous, corrosive, flammable and other types of chemicals not regulated by other laws, and some radioactive substances. The full text of the new law will be published in the August issue of *Soap and Chemical Specialties.*

—★—

Jefferson Elects President

Election of John D. McPherson as president and a director of Jefferson Chemical Co., Houston, Tex., equally owned by Texaco, Inc., and American Cyanamid Co., was recently announced. Mr. McPherson succeeds George R. Bryant who is retiring July 31.

He began his 23 years' experience in the chemical specialties field with Swann & Co. as an operator in 1937. He was chief of the production division at the U. S. Army Chemical Center at Edgewood, Md. during his Army service from 1941-1945.

Mr. McPherson joined the engineering division of American Cyanamid in 1945 as a chemical engineer. After serving in various posts, he was made manager of the manufacturers' chemicals department.

In June, 1955 he was elected vice president of operations of Jefferson. Before his current appointment, he had been executive vice president since 1958.

John D. McPherson

—★—

7th Annual SCC Seminar

The Society of Cosmetic Chemists recently announced it will hold its 7th annual Cosmetic Seminar September 15-16 at the Drake Hotel, Chicago.

Warren B. Dennis, as chairman of the seminar committee, is responsible for a series of symposia of interest to cosmetic chemists.

—★—

New Agency for "Oakite"

Assignment of advertising for "Oakite" household cleaner to Geyer, Morey, Madden & Ballard, Inc., was recently announced by B. T. Babbitt, Inc., New York. Under an agreement concluded with Oakite Products, Inc., in June, Babbitt handles all marketing for the cleaner.

—★—

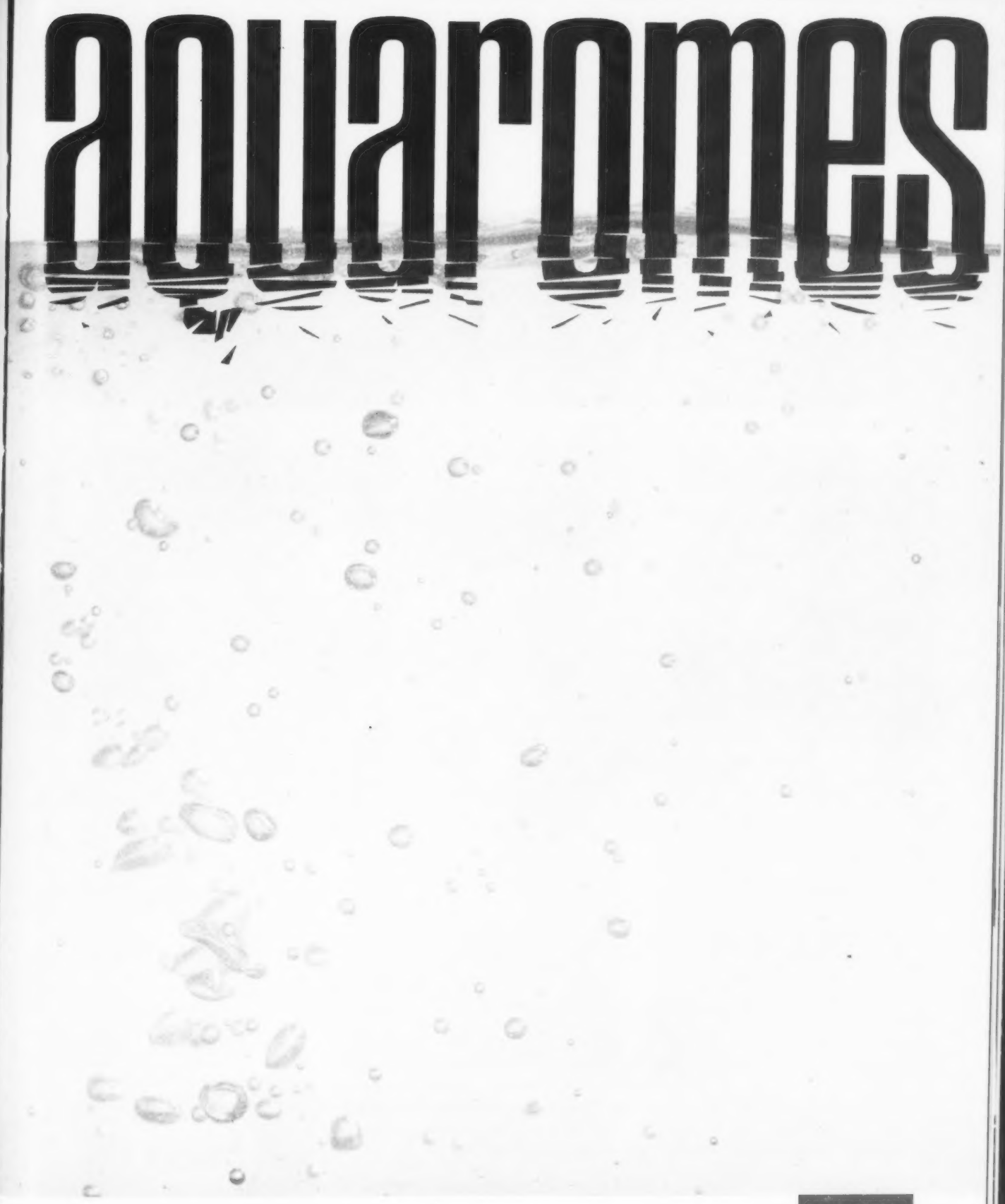
Second Price Reduction

General Electric Co., Waterford, N. Y., recently announced the second price reduction in 10 months of silicone fluid and emulsion products. This new price cut, like the first one, amounts to 4 per cent.

—★—

AHP Names Two

Appointment of John J. McClenan and John Phillips as assistants to the president was recently announced by American Home Products Corp., New York, drug, food and household goods manufacturer.



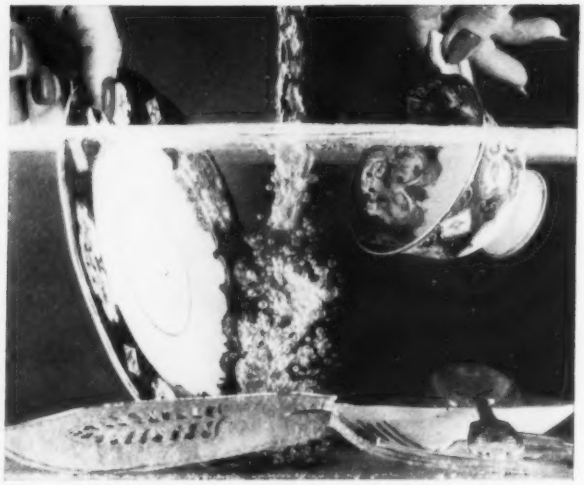
...the biggest name in water soluble perfumes!

Felton

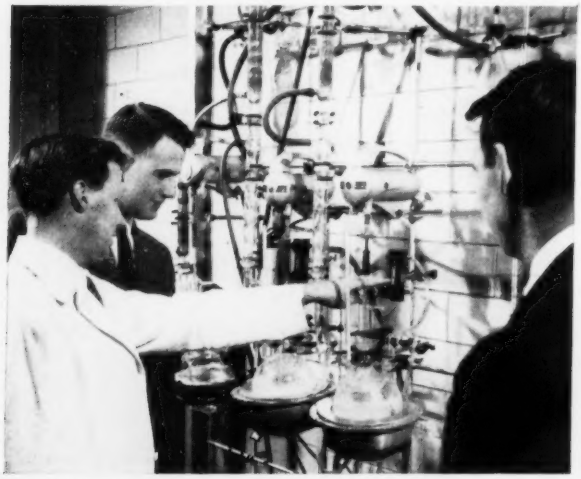
Problem involving incorporating perfume into your water-based product? Ask us.

Felton Chemical Company, 599 Johnson Avenue, Brooklyn 37, N. Y.

ENJAY OLEFINS — Enjay markets tetrapropylene, tripropylene and nonene. These chemicals fulfill the most rigid requirements as raw materials for anionic and nonionic detergents. Uniform purity and high quality contribute to the modern detergent's ability to get hard-to-wash surfaces cleaner.



TRIDECYL ALCOHOL — Water soluble nonionic surface active agents formed by the reaction of tridecyl alcohol with ethylene oxide are extremely well suited for use as household detergents. Surfactants made with tridecyl alcohol help increase penetrating power and loosen dirt.



TECHNICAL ASSISTANCE — At the Enjay laboratories, expert technical assistance and the latest testing facilities are available. Here, Enjay technical personnel can help you develop new products and improve existing ones.

QUICK SHIPMENTS — Shipments are made from conveniently located plant and storage facilities. Surfactant manufacturers are assured of prompt delivery and high uniform product quality when they order from Enjay.

HOW ENJAY SERVES...the surfactants industry

Enjay offers the surfactants industry the following high quality materials for all types of detergents, wetting agents, emulsifiers, sanitizers and foam control agents: Tetrapropylene • Tripropylene • Nonene • Tridecyl Alcohol • Decyl Alcohol • Isooctyl Alcohol • Isopropyl Alcohol • Benzene. For technical assistance or to order Enjay chemicals contact the nearest Enjay office.

HOME OFFICE: 15 West 51st Street, New York 19, New York. OTHER OFFICES: Akron • Boston • Charlotte • Chicago • Detroit • Houston • Los Angeles • New Orleans • Tulsa

EXCITING NEW PRODUCTS THROUGH PETRO-CHEMISTRY

ENJAY CHEMICAL COMPANY

A DIVISION OF HUMBLE OIL & REFINING COMPANY

ENJAY
PETROCHEMICALS

6 WIDELY USED BLOCKSON PHOSPHATES

THEIR PROPERTIES, USES AND SPECIFIC APPLICATIONS— PARTICULARLY IN SYNTHETIC AND SOAP BASED CLEANERS

FOR DATA BULLETINS, CHECK SQUARES AND MAIL THIS AD WITH YOUR CARD OR LETTERHEAD

BLOCKSON

☐ **TRISODIUM PHOSPHATE**

This is the original all-purpose cleaner and still the most widely used. An excellent emulsifier and saponifier. Nothing beats it for removing fat, grease and oil based soils. Offers a top combination of buffered high alkalinity *without* causticity. A superior base for building your improved detergents. Widely used in machine dish detergents, heavy duty, floor and metal cleaners. Check square for data bulletin.

BLOCKSON

☐ **TRISODIUM PHOSPHATE CHLORINATED**

A *must* for proper cleaning of hard surfaces, especially, glazed and ceramic. Boosts any dish detergent's cleaning power and rinsing action. An excellent destainer and bleacher; its chlorine is readily available. A top sanitizing agent and disinfectant. Sold under approved labels to breweries, dairies and canners. An important component in the new high-efficiency abrasive home cleaners.

BLOCKSON

☐ **SODIUM TRIPOLYPHOSPHATE**

The preferred all-purpose *complex* phosphate. Affords outstanding hard water control. Its synergism boosts the cleaning power of other components in your mix, particularly the wetting agents. Costs less than the replaced synthetics. Ends need to use harsh alkalis in formulation to offset high wetting-agent cost. Superior buffering, sequestration and peptizing. Used in dish and laundry detergents and in floor, wall and metal cleaners.

BLOCKSON

☐ **TETRASODIUM PYROPHOSPHATE**

A buffered synergist, sequestrant and dispersant. Free from the high alkalinity and causticity of other builders. Softens water without precipitating soils on surfaces. Enhances any formulation's free-rinsing performance. High solution stability. Used in dish detergents, vat cleaners and when the dispersion and viscosity reduction of a complex phosphate is required, as in clays and pigments and slurries.

BLOCKSON

☐ **POLYPHOS (Sodium Hexametaphosphate 67% P_2O_5)**

Highest phosphate content, solubility and water softening capacity of all sodium phosphates. Less Polyphos needed, so more room for your alkali — which is not used up in water softening since Polyphos softens by sequestration. Boosts action of wetting agent. Inhibits film. Buffered pH. For machine dish detergents, quality dairy and laundry cleaners, well-drilling muds and wherever a glass phosphate is indicated.

BLOCKSON

☐ **TETRAPOTASSIUM PYROPHOSPHATE**

The phosphate base for the newer all-purpose liquid cleaners and concentrates. High Solubility — 200 parts TKPP in 100 parts water at 50°F. Its synergism multiplies any formulation's hard-surface detergency. A powerful sequestrant-water softener; peak detergency in any hardness area. Prevents film, boosts rinsing action. Compatible with other components in your formulations; assures crystal-clear shelf life.

☐ **CHECK HERE FOR CATALOG OF OTHER BLOCKSON PHOSPHATES AND CHEMICALS.**

BLOCKSON **BLOCKSON CHEMICAL COMPANY**

*Chemicals Division / **Olin Mathieson Chemical Corporation** / Joliet, Illinois*

DIRECT FROM *COMMERCIAL* DISHWASHER TO TABLE

Hand polished? No! Washed and rinsed in a commercial dishwasher . . . but with one important difference. TRITON CF-10 was included in the built detergent used, *and* in the final rinse additive. More and more fine eating places now use this double protection to insure spotless crystal, china and silver.

Whether you recommend the use of either a detergent or a rinse additive based on TRITON CF-10 . . . *or both* . . . you'll be ahead in satisfaction and sales. Why make and sell commercial dishwashing compounds on price alone? Your customers are now looking for performance! Give it to them with TRITON CF-10. Write for formulating help.

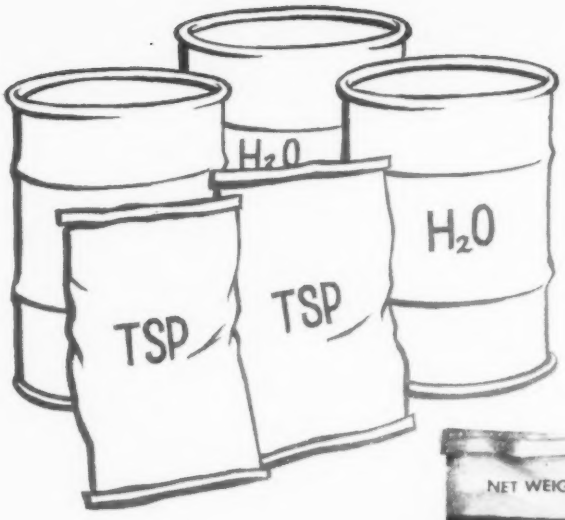
Chemicals for Industry

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

TRITON is a trademark, Reg. U.S. Pat. Off. and in principal foreign countries.

TRITON CF-10



Why pay to ship this?

THIS CUTS YOUR FREIGHT BILLS 56%

...and costs less, too!

That's right! Trisodium phosphate crystals are 57% water... practically three-fifths waste weight you pay to ship!

On the other hand, if you can substitute FMC TSP Anhydrous...

- Shipping costs are more than cut in half!
- Material costs are lower, too. You save $1.34 per cwt on an active-ingredient basis!
- 7 ounces of FMC TSP Anhydrous does the work of a pound of crystals!
- You handle and store less material!
- FMC TSP Anhydrous cakes less and flows more freely!

If you'd like to reduce your costs and gain these other advantages, we'll gladly help you make the change. Call us today!

SODIUM PHOSPHATES Hexaphos® Fosfodril® Sodaphos® (Brands of Sodium Glassy Phosphate) Disodium Phosphate Trisodium Phosphate Monohydrate Trisodium Phosphate Hemihydrate Monosodium Phosphate Trisodium Phosphate Anhydrous Sodium Acid Pyrophosphate Sodium Tripolyphosphate Tetrasodium Pyrophosphate Tetrasodium Pyrophosphate Crystals

POTASSIUM PHOSPHATES Dipotassium Phosphate Potassium Tripolyphosphate Monopotassium Phosphate Tripotassium Phosphate Tetrapotassium Pyrophosphate

Putting Ideas to Work

FOOD MACHINERY AND CHEMICAL CORPORATION

Mineral Products Division

General Sales Offices:

161 E. 42nd STREET, NEW YORK 17

The odor of CLEANLINESS

When it comes to the family wash, today's housewife demands above all else, that elusive and intangible "clean odor." What is it? Largely a psychological concept... however, certain carefully balanced combinations of perfume ingredients can give to a washday detergent that special "sunshine clean" quality. *Furthermore, this desired fragrance will cling to the finished wash... if the perfume compound is properly formulated.*

In the D&O Industrial Odorants Laboratories, a complete group of such "washday fragrances" has been developed, not only for *detergents* but for *blueing, starch* and *bleaches* as well. Let the D&O perfume chemists put the "odor of cleanliness" into your laundry products. Samples on request.

"Essentially for you"

D&O ESTABLISHED 1798

OUR 161ST YEAR OF SERVICE

DODGE & OLCOTT, INC.

180 VARICK STREET • NEW YORK 14, N. Y.

SALES OFFICES IN PRINCIPAL CITIES

ESSENTIAL OILS • AROMATIC CHEMICALS • PERFUME BASES • FLAVOR BASES • DRY SOLUBLE SEASONINGS

Which ULTRAWET® is right for YOUR cleaning formulation?

CHECK THIS CHART...

	Ultrawet	Solids	Molecular Weight	Appearance	Active Minimum	Recommended Applications
LIQUIDS						
Clear	30DS	30%	Medium	Clear, pale yellow	25.5%	Penetrant, wetting agent, metal cleaner, emulsion polymerization.
	60L	60%	High	Clear, pale yellow	60.0%	Liquid detergents, wet textile processing, shampoos, car wash, household detergent formulations, janitorial supplies.
	35KX	35%	Medium	Clear, pale yellow	31.5%	Liquid detergents and household cleaners, wet textile processing, emulsion polymerization, post emulsion stabilizer.
Slurries	35K	35%	High	Pale yellow	31.5%	Drum-dried and spray-dried cleansing compounds, light and heavy duty liquid detergents.
FLAKES	DS	100%	Medium	Light, cream colored	90%	Industrial detergents, emulsifier, dry mixing with alkalies, air entraining agent.
	K	100%	High	Light, cream colored	90%	Industrial detergents, heavy-duty household detergents, emulsifier, dry mixing with alkalies.
	K Dense	100%	High	Light, cream colored	90%	Same as above.
	KX	100%	Medium	Light, cream colored	90%	Same as 35KX in dry form.
	KX Dense	100%	Medium	Light, cream colored	90%	Same as KX—except smaller particle size with increased density, air entraining agent.
BEADS	SK Bead	100%	High	White, free flowing	40%	Light-duty household detergents, dry mixing with alkalies.
	SK Bead High Density	100%	High	White, free flowing	40%	Same as above—synthetic wool washes, air entraining agent.

The Atlantic Refining Company

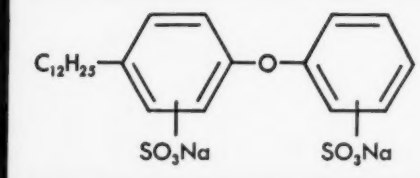
ATLANTIC PETROLEUM CHEMICALS

THE ULTRAWETS GIVE YOU: light color · superior foaming · fast wetting and low surface tension · freedom from odor

260 South Broad Street, Philadelphia 1, Pennsylvania. IN CANADA: Naugatuck Chemicals Division of Dominion Rubber Co., Ltd. IN EUROPE: Atlantic Chemicals SAB, Antwerp, Belgium. IN SOUTH AMERICA: Atlantic Refining Company of Brazil, Rio de Janeiro.

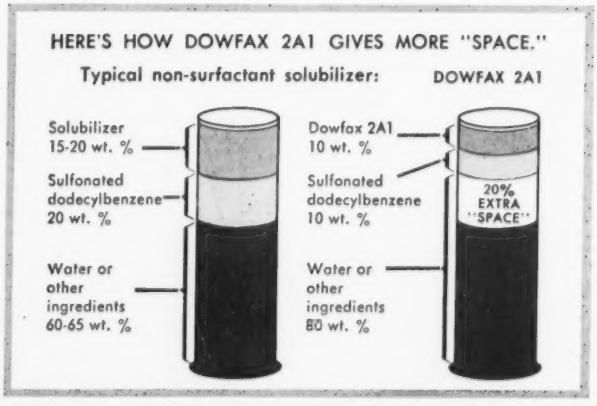
DOW | NEW FROM DOW

DOWFAX 2A1



New anionic surfactant gives valuable "DIVIDEND SPACE" by eliminating coupling agents

Dowfax® 2A1 surfactant exhibits superior solubility and coupling ability. It produces clear, sparkling formulations with "dividend space," the extra "room" usually occupied by non-working coupling agents required to hold some detergents in solution. Dowfax 2A1 has a unique chemical structure that makes it soluble and stable in alkalies and acids and soluble and stable to metal salt build-up. It can be readily defoamed for applications in the fields of heavy duty liquids, alkaline cleaning, and many others. Write for data and samples. THE DOW CHEMICAL COMPANY, Midland, Michigan, Technical Service and Development, Department 601ER7.



THE DOW CHEMICAL COMPANY · MIDLAND, MICHIGAN

NOPCO®

A SKILLED HAND IN CHEMISTRY...AT WORK FOR YOU

NOPCO®
HYONIC® PE SERIES

A wide range of nonionics for household and industrial cleaners

The Hyonic PE Series—ethylene oxide condensates of alkylated phenols—have become increasingly popular in the surface-active field. Combining the great range of oil solubility of the alkyl phenols with the infinite water solubility of ethylene oxide, they provide almost limitless hydrophobic-hydrophilic ratios and form the basis for products embracing the entire surfactant category: defoamers, emulsifiers, detergents and wetting agents.

The lower-numbered compounds in the Hyonic PE Series are useful as emulsifiers and emulsifier components. Hyonic PE 30 finds extensive use as a defoamer.

The middle range of Hyonic PE compounds (PE 70-100) are all-purpose products with superior detergent, rapid wetting, and high foaming characteristics. Hyonic PE 70, a low-foaming compound, is widely used in household and industrial detergents.

The higher-numbered compounds perform an essential function as wetting agents and high-foaming detergents when temperature is a factor. Their high solution cloud point contributes increased solubility and detergency at high temperatures and in more concentrated salt solutions. Used in dairy detergents and milkstone remover, antiseptic sanitizer, paint and woodwork cleaners.

Nopco's complete line of surface-active chemicals enables manufacturers to place a single order for all their needs and at the same time to save through quantity discounts and lower shipping charges. Nopco chemists are ready to help tailor Hyonic PE compounds to your performance requirements. Write today for full information and literature.

NOPCO CHEMICAL COMPANY

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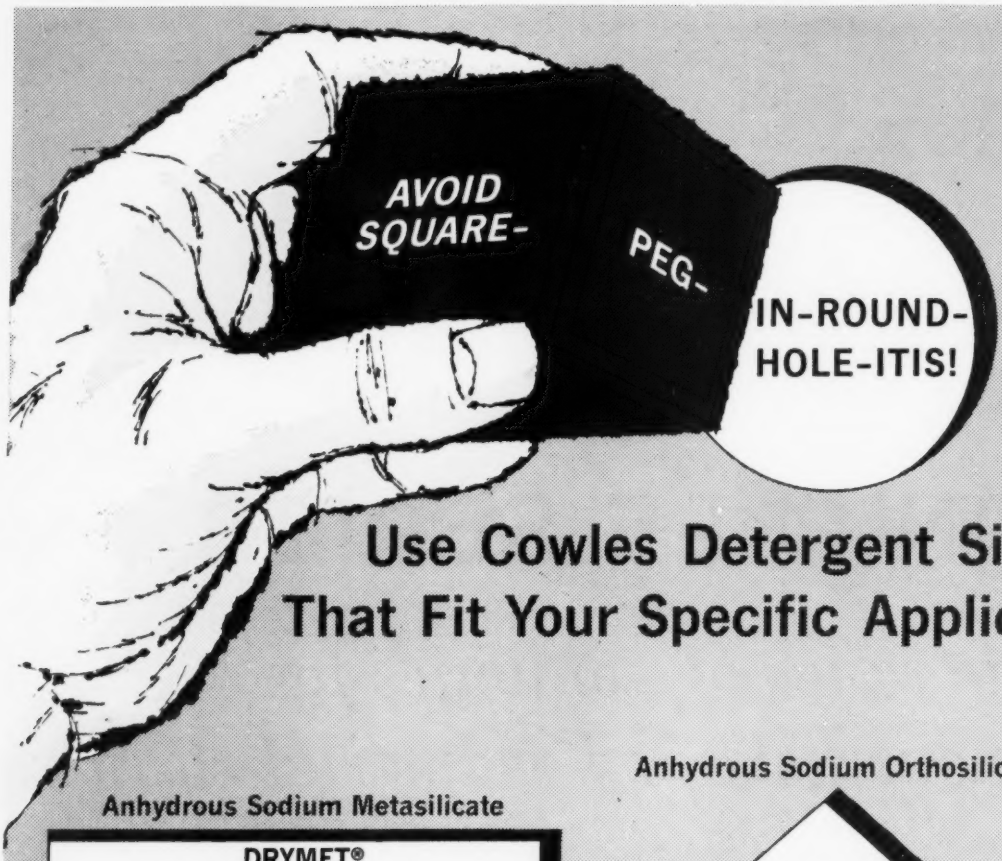
Harrison, N.J. • Richmond, Calif. • Cedartown, Ga. • Boston, Mass. • Chicago, Ill. • London, Canada • Mexico, D.F. • Corbeil, France

Manufacturing Licensees Throughout the World



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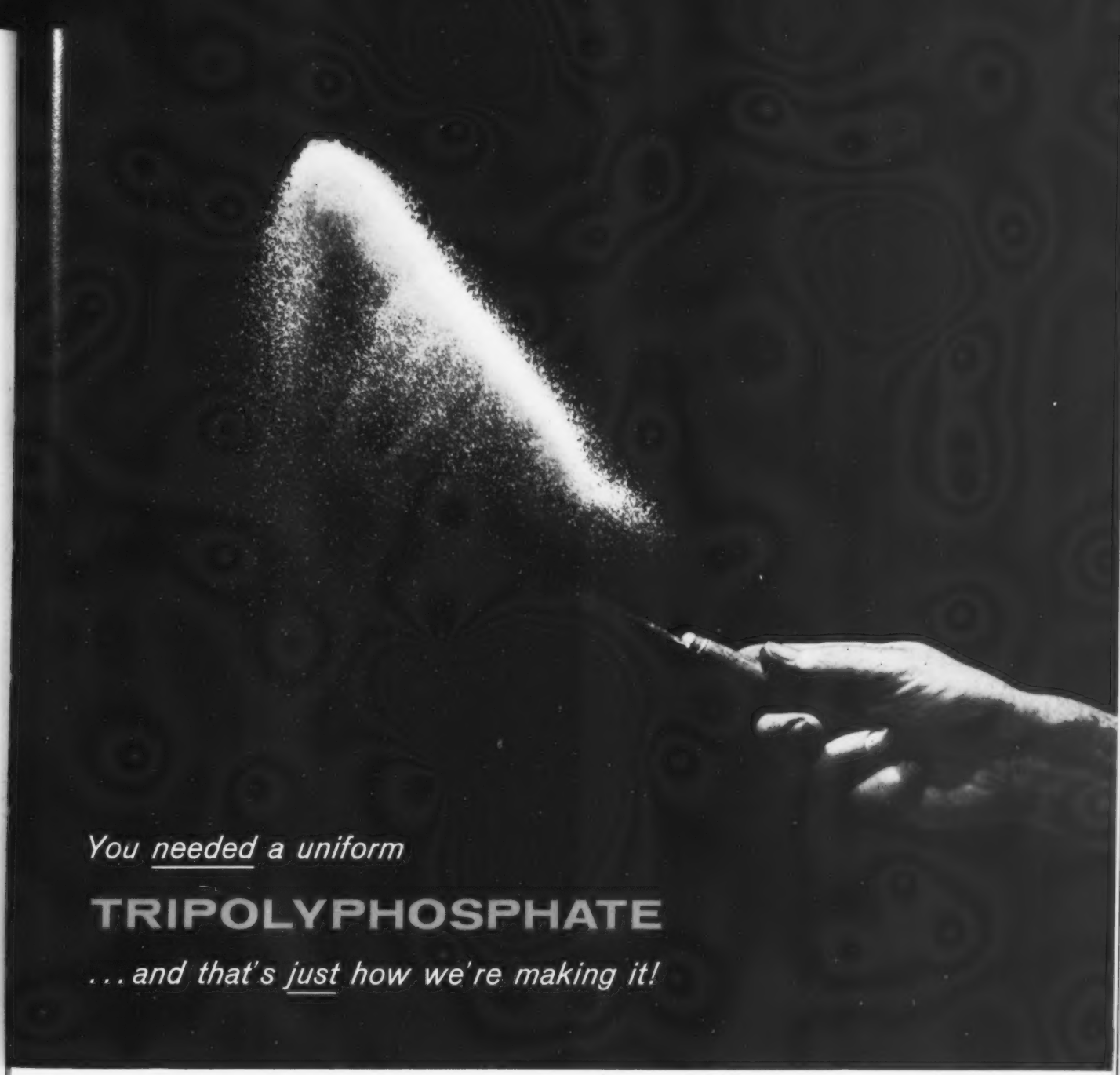

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. . . and that's just how we're making it!

UP-TO-DATE manufacturing equipment and methods make the difference. Every known technical advance has been incorporated into the new "AA Quality" process to provide a sodium tripolyphosphate that is remarkably uniform, chemically and physically.

The pay-off is *yours*—in a highly dependable performance that is passed on to the formulations in which it is used.

We'd like to send you a sample—and we know you will like what you find.

Top detergent quality in every granule . . .

AA QUALITY SODIUM TRIPOLYPHOSPHATE

AA QUALITY SODIUM TRIPOLYPHOSPHATE
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ALKYL DIMETHYL BENZYL AMMONIUM CHLORIDES

	ALKYL DISTRIBUTION (related groups from C_8 to C_{18} UNLISTED)		
	C_{12}	C_{14}	C_{16}
INTEXSAN LB 50 A	50	30	17
INTEXSAN LB 50 B	61	23	11
INTEXSAN LB 50 C	47	18	8
INTEXSAN LB 50 D	68	27	5
INTEXSAN MB 50 A	24	10	50
INTEXSAN MB 50 B	25	32	28
INTEXSAN MB 50 C	20	40	28
INTEXSAN MB 50 D	22	36	28
INTEXSAN MB 50 F	30	60	5

OTHER QUATERNARIES

INTEXSAN LCB 50/60	Alkyl dimethyl dichloro-benzyl ammonium chloride
INTEXSAN OE 60/75	Alkenyl dimethyl ethyl ammonium bromide
INTEXSAN ABM 50	Dodecylbenzyl trimethyl ammonium chloride
INTEXSAN 7212	50% solution composed of 25% alkyl dimethyl benzyl ammonium chloride, 25% alkyl dimethyl dichloro-benzyl ammonium chloride

INTEX

Chemical Corporation

MANUFACTURERS OF INDUSTRIAL CHEMICALS

as the editor sees it...

LABELING . . . The U. S. Senate on June 28 passed the Hazardous Substances Labeling Act, which had been approved earlier this spring in the House of Representatives. The bill, which now awaits the signature of President Eisenhower, in our opinion, is a good one. It was worked out in close cooperation between industry and the law makers. In addition it has received the support of the Department of Health, Education and Welfare. Such a display of harmony in an area that could be controversial is rare. It augurs well for the law, which is not only workable, but should accomplish the end for which it is intended.

* * * * *

COUPONS . . . When we stated a couple of months ago that the "manufacturer has invited current abuses" in coupon redemption, we knew that we would be in sharp disagreement with leading couponers in the food and soap field. And we are. It is our belief that couponing has been done on such a tremendous scale, inspired to a great extent by competition, that the whole thing has got out of control. By letting it get out of control, we feel that the manufacturers themselves have invited abuses.

Cash redemption of coupons is a tough problem to lick in the hustle-bustle of the modern supermarket. In the family grocery store of 50 years ago, it was no problem. To beat cash redemption, we believe that the coupon, or half of it, should be attached to the package of merchandise,—actually glued or tipped on,—*before* the goods go on the shelves. If manufacturers believe that in any other way they will halt cash redemption, we feel they are a bit naive.

Let's forget all the fancy words about cooperation and face one fact. Neither the supermarket manager nor his check-out clerks give one hoot about the manufacturer or his coupons. How can anybody who has studied the situation,—and we have,—conclude otherwise?

Couponing redemption rules have got to be tightened up. Today, the door to cash redemption stands wide open. It's got to be closed. And this means changing the entire physical set-up of coupons, coupon handling and coupon redemption. Otherwise manufacturers will continue to be mulcted out of millions annually.

* * * * *

BUTANE . . . Because it contained butane, the City of Philadelphia recently banned the sale of a well-known aerosol shave cream. Apparently, the fire department of Philadelphia was responsible, maintaining that the product should have been labeled "flammable." The Bureau of Explosives tested the product and passed it as "safe." Then the city lifted the ban. Why they didn't get the full story before they banned the product is another one of those inexplicable happenings in government departments. We imagine that there were a few red faces in the Philadelphia Fire Department.

* * * * *

SOCIAL . . . Since Hector was just a pup, the Chemical Specialties Manufacturers Association has been known as "a working association." Its two meetings a year have always been given over most strictly to business sessions and serious discussions of industry problems. Many of the old-time members came to meetings for business, and business only. They had no time to play and made no bones about it. Let the play-boys go elsewhere. This is and always has been an outfit for serious minded discussions.

And so, when some of the younger bloods came up with the idea of a CSMA golf tournament recently, we imagine that to a few old-timers, it came as something of a jolt. But the tournament was a wonderful success. Some 180

Quality reaches the highest peaks in

GIVAUDAN'S CYCLAMEN ALDEHYDE

In this widely used aromatic chemical, Givaudan has achieved an unsurpassed standard of quality and uniformity.

A pure synthetic body, Cyclamen Aldehyde is made under rigid control from readily available domestic materials. It is stable in price as well as in olfactory and chemical quality.

With its intensely floral scent, Cyclamen Aldehyde is most useful in lily-of-the-valley, lilac, linden and cyclamen fragrances; in floral bouquets; and in cream and soap perfumes.

Givaudan offers Cyclamen Aldehyde in different grades to meet the varying needs of the perfumer. Our staff will gladly help you determine the grade best suited for your particular requirements.

GIVAUDAN

GIVAUDAN-DELAWANNA, INC.

321 West 44th Street, New York 36, N. Y.

members and guests attended. It was a great day. Not only that, but next month the aerosol group is holding an invitation golf tournament and in September, CSMA will hold another tournament in the mid-west. Looks like old CSMA has really gone social on us probably to the chagrin of the long hairs.

* * * * *

BOOTLEG . . . A spreading practice in some parts of the country is house-to-house selling of detergents which are represented to be nationally known brands. Actually the products are strictly bootleg and are being peddled by fly-by-night outfits. Reports on the quality of the products indicate that they are just about what might be expected under the circumstances.

Door-to-door selling is big business in America today. Many products of highest quality and finest reputations are sold that way. But hardly ever at cut prices. To any housewife who has dealt with salesmen for well-known firms at her door, a cut price should be the first danger signal. But we suppose the ever-present urge for a bargain is just too much to resist. So, she takes a chance and gets stung.

We imagine that the unusual success in recent years of door-to-door selling was bound to bring bootleg imitators into the picture. That they represent their shoddy merchandise to be standard national brands is the natural counterpart of their crooked act.

* * * * *

SMELLIES . . . That's what our staid friends in Britain have nicknamed perfumed motion pictures. We're a bit startled that they are permitting such with a touch of humor to seep into their business press. Smellies! Of all things. And they seem to know a lot about them and the 2,000 basic scents which "can be matched at will in this Hollywood alchemy." They mention the farmyard scene with the pigsty vying with the "chain store perfume of the farmer's daughter." And the German scientist who has discovered "Eau de Leo, No. 4" designed to scare away hippos that damage crops in Zululand.

Maurice Schofield who writes on this intriguing subject in *Soap, Perfumery & Cosmetics*, is a subtle humorist. But he should have gone further and told what a future is opened up for the perfumer, the man who is to create the odor of low tide on the mud flats and then switch quickly to the aroma of frying pork chops. Yes, for the perfumer we see a great opportunity to go completely nuts, A lot of them are a trifle nuts already. Here is the chance to go all the way. Who will want to stick to his knitting of working out an odor for urinal blocks or brass polish when a vista of Hollywood beckons. Maybe next the "smellie" producers will undertake to raid the ranks of our dutiful and hardworking perfumers. Heaven forbid.

* * * * *

WAXING . . . Floor coverings—including newer vinyl types—benefit from waxing in five major respects. So states a recent report on a research study made on behalf of the Waxes and Floor Finishes Division of CSMA. Not only does the use of floor wax "enhance" the beauty of floors, giving them greater protection against scratching and dulling, but it increases gloss from 3 to 16 times more than the same surface left unwaxed. What's more say the investigators, waxing benefits floors by exhibiting "dramatic superiority" in brightness and resistance to soiling.

Because of the importance of the stake every floor wax manufacturer holds in this market, estimated variously at between $100 and $150 million annually, it hardly seems necessary to urge them to obtain copies of the research report. Wax makers should familiarize themselves, their salesmen, and above all their customers, with contents of the report. It should help to clear up some of the confusion and conflicting claims regarding "no-waxing" made by some manufacturers of floor coverings, primarily in the promotion of the newer types of vinyl.

as the reader sees it...

"Honesty & Salesmanship"

Editor:

Re article " . . . And One to Grow On," which appeared in the June issue of *Soap & Chemical Specialties.*

Congratulations Fred Binter on the wonderful progress. To me the interviewer skipped the two most important points in the success story: honesty and salesmanship.

Robert W. Glenn
Emulso Corp.
Buffalo, N. Y.

—★—

Sodium Sulfate, Light?

Editor:

In the June issue of *Soap & Chemical Specialties* in an article on "Washing Powders Sans Spray Drying," by A. Davidsohn of Haifa, Israel, reference is made to "sodium sulfate, *light*."

We would be interested in knowing the specifications of this material, particularly its bulk density and particle size and where it is available.

Dr. E. C. Dreby, 3rd
Scholler Brothers, Inc.
Philadelphia

We are checking with Dr. Davidsohn and as soon as we hear from him we will be glad to inform Dr. Dreby and any of our other readers who may be interested in the specifications on this grade of sodium sulfate. Ed.

—★—

Wants "Diaphene" Sample

Editor:

On page 56 of the June, 1960 issue of *Soap & Chemical Specialties*, there is mentioned a product called "Diaphene," which was the subject of a paper by Dr. Herbert C. Stecker, Stecker Chemicals, Inc., and Richard E. Faust, Cuticura Laboratories.

Our laboratory is very interested in receiving a sample of "Diaphene" and we would appreciate any information you can give us on whom to contact.

Wanda Bartosik
Ralston Purina Co.
Checkerboard Square
St. Louis 2, Mo.

To Miss Bartosik and any of our other readers who may be interested in this germicidal ingredient, "Diaphene" is a product of Stecker Chemicals, Inc., 45 North Broad Street, Ridgewood, N. J. "Diaphene" was discussed in a paper before the recent semi-annual meeting of the Society of Cosmetic Chemists. Ed.

—★—

Couponing

Editor:

A number of our people have read the editorial on couponing which appeared on page 55 of the May issue of *Soap & Chemical Specialties.* In all honesty, we are disturbed by the very clear statement " . . . the manufacturer has invited current abuses."

I am anxious that you understand that we and a great many other people around the country continue to use coupons effectively. Especially, this is an efficient way of introducing the homemaker to new or improved products which it is felt will make her homemaking task easier.

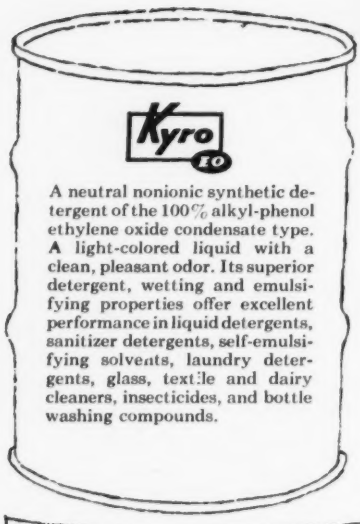
We, of course, realize that proper redemption of coupons does cause some slow-up at a supermarket check-out counter but we find it difficult to see where proper coupon redemption entails significantly more time than the handling of trading stamps. Further, as you undoubtedly know, many retailers believe sufficiently in the value of coupons to issue large numbers of them themselves.

The matter of cash redemption of coupons is a relatively recent development, and of course, is clearly undesirable. It is being realized as such, apparently, by a number of retailers because we have heard reports of improvements which are now taking place in various parts of the country. Additionally, we have gotten reports from consumers that many stores have tightened up their coupon handling. Evidence of the dealers' desire to eliminate poor coupon handling and to work with manufacturers on this entire problem is presented in the attached clipping from *Supermarket News* referring to a meeting of supermarket repre-

(Turn to Page 105)

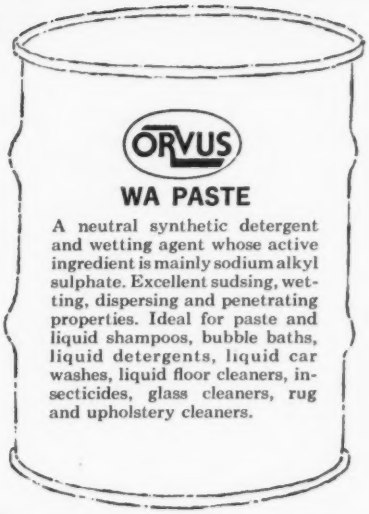
"To the victor . . .": Robert E. Horsey, vice - president, sales, Givaudan - Delawanna, Inc., New York, and president of the Essential Oil Association of the U.S., presents "President's Cup" to Tim Reardon of Roubechez, Inc., winner of 10th EOA golf tournament, held at White Birches Golf & Country Club, Haworth, N. J., June 7.

THERE'S A PROCTER & GAMBLE PRODUCT FOR EVERY FORMULATION NEED



Kyro EO

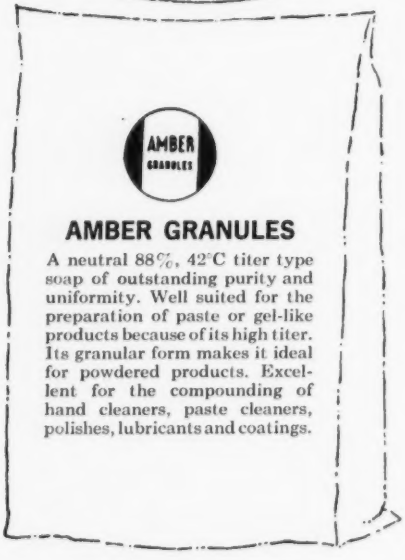
A neutral nonionic synthetic detergent of the 100% alkyl-phenol ethylene oxide condensate type. A light-colored liquid with a clean, pleasant odor. Its superior detergent, wetting and emulsifying properties offer excellent performance in liquid detergents, sanitizer detergents, self-emulsifying solvents, laundry detergents, glass, textile and dairy cleaners, insecticides, and bottle washing compounds.



ORVUS

WA PASTE

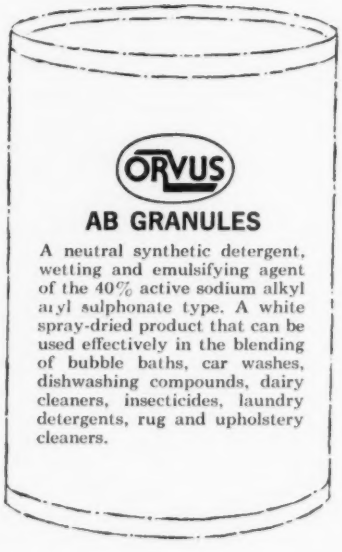
A neutral synthetic detergent and wetting agent whose active ingredient is mainly sodium alkyl sulphate. Excellent sudsing, wetting, dispersing and penetrating properties. Ideal for paste and liquid shampoos, bubble baths, liquid detergents, liquid car washes, liquid floor cleaners, insecticides, glass cleaners, rug and upholstery cleaners.



AMBER GRANULES

AMBER GRANULES

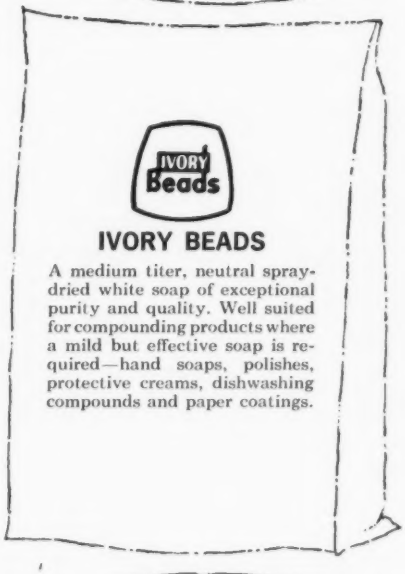
A neutral 88%, 42°C titer type soap of outstanding purity and uniformity. Well suited for the preparation of paste or gel-like products because of its high titer. Its granular form makes it ideal for powdered products. Excellent for the compounding of hand cleaners, paste cleaners, polishes, lubricants and coatings.



ORVUS

AB GRANULES

A neutral synthetic detergent, wetting and emulsifying agent of the 40% active sodium alkyl aryl sulphonate type. A white spray-dried product that can be used effectively in the blending of bubble baths, car washes, dishwashing compounds, dairy cleaners, insecticides, laundry detergents, rug and upholstery cleaners.



IVORY Beads

IVORY BEADS

A medium titer, neutral spray-dried white soap of exceptional purity and quality. Well suited for compounding products where a mild but effective soap is required—hand soaps, polishes, protective creams, dishwashing compounds and paper coatings.

ORVUS

ES PASTE

A specially developed synthetic detergent whose active ingredient is mainly modified sodium alkyl sulfate. Offers exceptional efficiency and stability over a wide range of operating conditions. Its excellent wetting, penetrating, sudsing, dispersing and emulsifying properties make it well suited for the preparation of liquid shampoos, bubble baths, liquid detergents, liquid floor cleaners, insecticides, car washes, emulsion cleaners.

Procter & Gamble will gladly supply you with information on how you can save time and money when you formulate with Procter & Gamble products. You can also get technical help in connection with their use by writing to:

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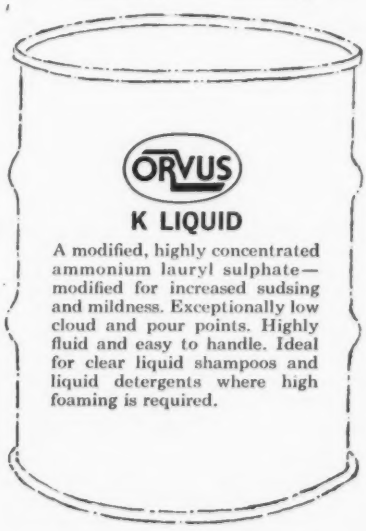
BULK SOAP SALES DEPARTMENT
P. O. BOX 599, CINCINNATI 1, OHIO



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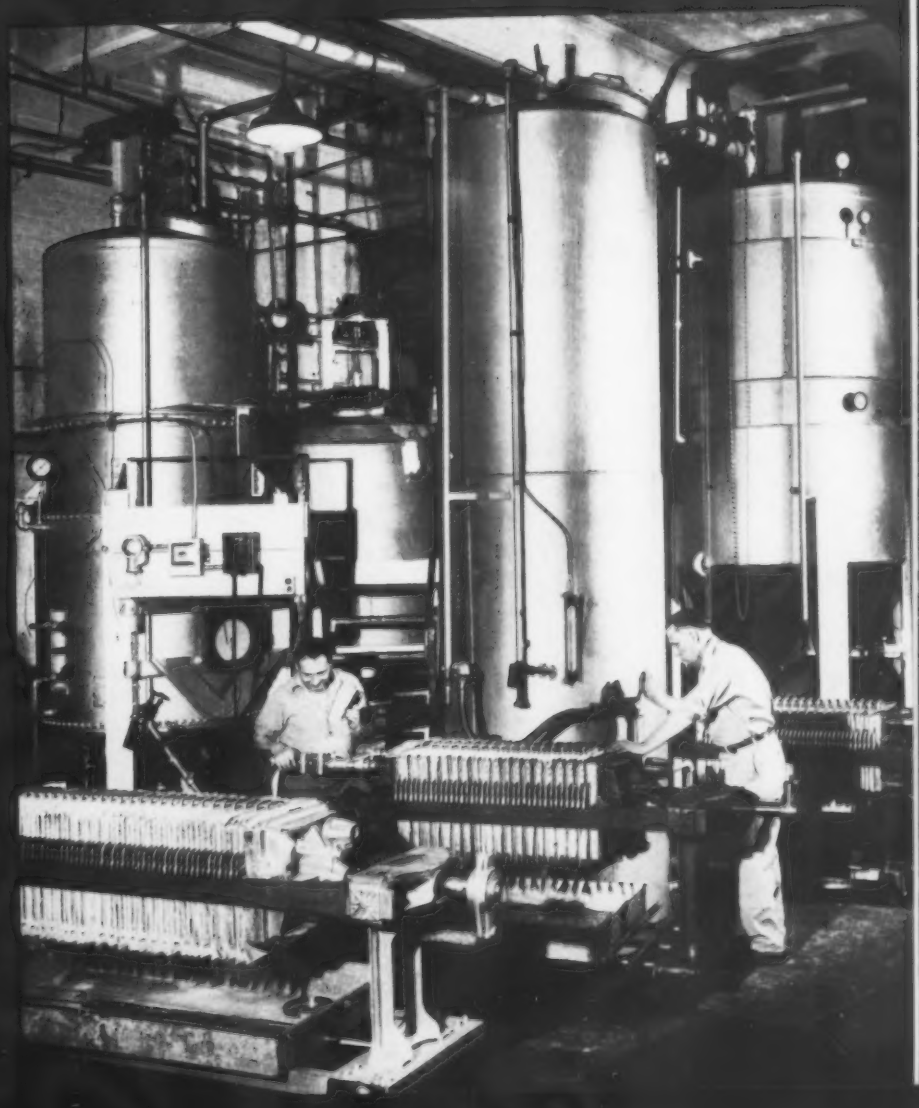
K LIQUID

A modified, highly concentrated ammonium lauryl sulphate—modified for increased sudsing and mildness. Exceptionally low cloud and pour points. Highly fluid and easy to handle. Ideal for clear liquid shampoos and liquid detergents where high foaming is required.

Detergents . . . Cleansers . . . Soaps . . .



Give her the detergent she wants . . .

with 2 new TERGITOL Nonionics

She has many cleaning jobs each day, and for each she has a favorite product—the one that helps her best. Be certain that your product is one of her regulars; customize its formula with TERGITOL Nonionics.

CARBIDE offers a complete selection of TERGITOL Surfactants, each with distinctive and useful properties. And, a continuing research program in detergent chemistry brings you such new products as—

TERGITOL E-68—a semi-solid nonionic, with high water solubility and good caustic stability. The cloud point of a 0.5 per cent solution of E-68 in distilled water is 68°C. (154.4°F.).

TERGITOL E-35—another caustic-stable nonionic for use with *dry* alkaline compounds. The cloud point of a 0.5 per cent solution is 35°C. (95°F.). E-35 has low foaming and good wetting action and is highly effective for heavy-duty cleansing of many types.

E-35 and E-68 can be effectively combined with other TERGITOL Nonionics to give you a detergent product that *is* one of her regulars. The CARBIDE Technical Representative in your area will gladly discuss your special requirements with you—and he'll show you how combination orders of TERGITOL Nonionics can save you money while allowing you to customize your formula. Give him a call; or write: Union Carbide Chemicals Company, Division of Union Carbide Corporation, 270 Park Avenue, New York 17, New York.

UNION CARBIDE CHEMICALS COMPANY

UNION CARBIDE

New Developments in Surfactants

By Donald Price, Ph.D.*,
New York Consultant

SURFACE active agents all wet certain kinds of surfaces preferentially, disperse and suspend soil particles, emulsify oil and grease, produce foam, and perform the complex job known as detergency. However, it rarely, if ever, happens that any one compound displays all of these properties to the same degree. On the contrary, the rule is that one property generally predominates rather strongly over the others and so determines the field of application of the product. It is this characteristic of surface active agents that accounts for their being variously called wetting agents, dispersants, emulsifiers, synthetic detergents and so forth.

For the purpose of this paper, we shall define surface active agents, or surfactants, as synthetic organic compounds which in aqueous solution lower surface tension and display the kinds of surface active properties referred to above.

Up until World War I the only surface active materials commercially available were soaps, sulphonated oils and so-called Twitchell reagents. Soap is too familiar to us to require comment. Its discovery dates back to the time of the Roman Empire, and it has been an article of commerce for about a thousand years. The sulphonated oils, which are made by reacting animal and vegetable oils with sulphuric acid, are such complex mixtures that, despite the voluminous technical literature which has grown up around them, their chemical composition is still not completely understood. Sulphonated castor oil was introduced into commerce in the 1870's under the name of Turkey red oil as a dye assistant for alizarin dyes and since that time the use of sulphonated oils has been mainly confined to the textile and leather industries. The Twitchell reagents are used for fat splitting and have little importance for our present purposes.

The development of the synthetic surface active agents was a by-product of the Allied blockade of Germany during World War I. Fats became too valuable as foodstuffs to be used for soap making; it was only natural, therefore, that German chemists should seek ways to produce detergents from domestic raw materials which were in better supply.

One result of this effort was a patent (1) filed in 1917 disclosing the use of an alkyl sulphonate, based upon coal tar, as a detergent. It apparently came too late to be of practical value and with the resumption of fat imports to Germany after the war, the need for such a product became less urgent. Nevertheless, it had been demonstrated that non fat-based detergents could be made, a fact which was of considerable interest to the German textile industry: This industry was the largest consumer of soap and was burdened with a substantial economic loss due to soap precipitation by hard water prevalent throughout much of the country.

German chemists soon realized that an efficient detergent, less sensitive to hard water salts than soap would be a boon to the textile industry. It was due to their activities during the period from the middle of the 1920's until the outbreak of World War II that all but a few of the basic chemical types

*Paper presented during 46th midyear meeting, Chemical Specialties Manufacturers Assn., Chicago, May 17, 1960.

of surface active agents in use had been discovered and placed on the market, first in Germany, and soon afterwards in this country. American contributions were also substantial, particularly along the lines of practical commercial development.

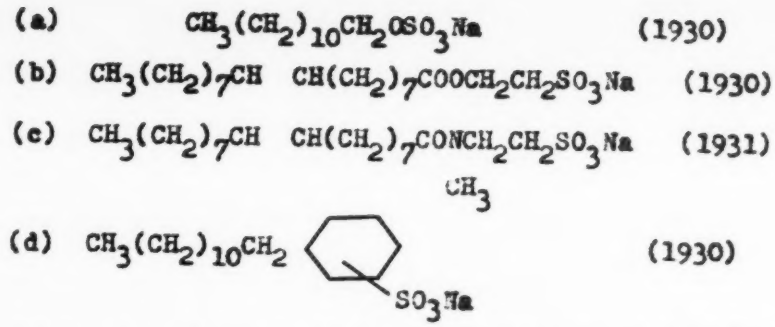
Surfactants Defined

Surface active agents, although they differ widely in chemical composition, have one characteristic feature in common. Their molecules always comprise two parts which exhibit different solubility behavior. One part, the hydrophobic or water-"hating" group generally consists of a large hydrocarbon residue of some sort which is characteristically water insoluble; while the other, the hydrophilic or water-"loving" group, is made up of a typically water soluble residue, such as a sodium sulphate or sulphonate radical.

A proper balance between these two groups is a necessary condition for surface activity. If the hydrocarbon residue is too small the solubilizing effect of the hydrophilic group over-balances its water repellent action and the molecule dissolves completely. If, on the other hand, the hydrophobic group is too large, the solubilizing effect of the hydrophilic group is overcome and the compound shows no tendency to dissolve at all.

Surface active agents owe their unique behavior to this balance between two antagonistic chemical groupings present in the same molecule. Since surface active agents cannot dissolve completely, nor remain completely undissolved, they concentrate at surfaces, with the hydrophilic group in the water layer and the hydrophobic group either projecting into the air or attaching itself to some water repellent surface such as a dirt particle or a layer of oil.

Surfactants are colloidal in nature and form micelles, or colloidal aggregates, in solution. The micelles of a surface active agent will ordinarily comprise a hundred or so molecules compactly grouped together with the hydrophobic ends in the center as far away from the water as they can get and the hydrophilic groups outward, forming the surface layer of the micelle.



Anionic surface active agents: (a) fatty alcohol sulphate; (b and c) "blocked" carboxyl compounds ("Igepon A" and "Igepon T"); (d) alkyl aryl sulphonate.

The manner in which surface active agents ionize in aqueous solution forms the basis for classifying them into three main groups. If, on ionization, the portion of the molecule containing the large hydrophobic group acquires a negative charge, becoming the anion, the compound is classified as anionic. If, on the contrary, the part containing the hydrophobic group becomes the cation by acquiring a positive charge the compound is known as a cationic. Surface active agents in which the hydrophilic portion of the molecule consists of a succession of weakly hydrophilic centers such as ether linkages or hydroxyl groups, and which consequently do not ionize at all, are known as non-ionics. A fourth class, the amphoterics, have both an anionic and a cationic center in the same molecule.

Chemical Constitution

Examples of the most widely used types of chemical compounds coming under each of the major classes, are as follows:

I. Anionics

1. *Fatty Alcohol Sulphates* — The basic work on these products was done in Germany and to some extent also in the United States during the 1920's, and they were introduced into commerce in 1930.

The first problem was to develop an adequate source of fatty alcohols since, with the single exception of cetyl alcohol, they do not occur in nature in sufficient quantity for commercial use. This was accomplished by high-pressure catalytic hydrogenation of fatty acids or their esters, to fatty alcohols of the same number of carbon atoms. Sulphonation was carried out by reaction with sulphuric acid, oleum or chlorosulphonic acid (2).

The fatty alcohol sulphates have the same chemical configuration as the soaps and are therefore exceptionally good detergents. In addition, they have the marked advantage of good stability toward hard water, and high foaming power. These products rank third among surface active agents in volume produced. For many applications they are unsurpassed; only their relatively high cost has prevented them from attaining a much wider use. Fatty alcohol sulphates are sold under the trade names of "Duponol," "Orvus," "Sipon" and "Maprofix."

2. *"Blocked" Carboxyl Compounds* — Another means of offsetting the hard water instability of soaps while preserving the same desirable chemical configuration was to form esters or amides of the fatty acids using a reactant containing the strongly hydrophilic sulphonate group.

Compounds of this class were developed in Germany in the 1920's (3) and introduced into commerce in 1930 and 1931. Since that time, the basic structure has been varied considerably with con-

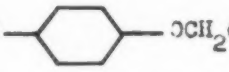
sequent variation in properties and widened applications. The most important products of this class are marketed under the trade name of "Igepons."

3. *Alkyl Aryl Sulphonates*— Although the basic idea of alkylating and sulphonating naphthalene goes back to the Gunther patent issued in 1917, which resulted in the development of the "Nekals," these products did not find a place as detergents, but instead have gone into other applications.

It remained for Flett and his co-workers at the National Aniline and Chemical Co. to develop the first practical low-cost synthetic detergent by introducing dodecyl benzene sodium sulphonate about 1930. This product was the forerunner of a host of analogous alkyl aryl sulphonates which now take the lion's share of the consumer market. They are sold under such trade names as "Nacconol," "Santomerse," "Oronite," "Ultrawet," "Sulframin" and many others.

4. *Miscellaneous Types* — The carbon chains used in all of the surface active compounds mentioned up to this point occur ready-made in nature, being derived either from fats or petroleum sources. In a noteworthy American development, J. N. Wickert (4) and his associates at Carbide & Carbon Chemicals Corp., by an ingenious use of the aldol condensation actually built up long chains from low molecular weight aldehydes and ketones. The resulting condensation products upon reduction of the olefinic bonds and carbonyl groups followed by sulfation yielded primary and secondary alcohol sulphates. These products were placed on the market in the 1930's under the trade name of "Tergitols," a designation which has since been broadened to include surface active compounds of other structures also. The original "Tergitols" are outstanding wetting agents, foamers and penetrants.

(a) $CH_3(CH_2)_nCH_2OCH_2CH_2(O\,CH_2CH_2)_xOH$ (1935)

(b) $CH_3(CH_2)_xCH$ —  — $OCH_2CH_2(O\,CH_2CH_2)_yOH$

Non-ionic surface-active agents: (a) fatty alcohol-based non-ionic; (b) alkyl phenol-based non-ionic.

Another important American development was the synthesis of diesters of sodium sulphosuccinate by esterification of maleic anhydride with alcohols of medium chain length, for example 2-ethyl hexanol, followed by the addition of sodium bisulphite to the double bond (5). These compounds in which the hydrophilic group occupies a position in the center of a long carbon chain are the most powerful wetting agents available. The dioctyl ester described above came upon the market during the 1930's under the trade name of "Aerosol OT," but is now marketed under several other trade names also.

II. *Non-Ionics*

The starting point for nonionic surfactants is always a hydrophobic base which includes one or more groups with reactive hydrogen atoms, such as hydroxyl or primary amino groups. The necessary hydrophobic - hydrophilic balance may be secured by reacting the said groups with glycols, but is far more often obtained by using ethylene oxide. In this way, polyoxyethylene chains of any desired length may be readily built up.

Early patents (6) disclosed the use of fatty alcohols as the hydrophobic bases with which to react ethylene oxide, but because of the high cost of the alcohols, the market for non-ionics remained small, notwithstanding their many desirable properties.

It was not until the introduction of the alkyl-substituted phenols (7) as hydrophobic bases for ethylene oxide condensates that the market for nonionics began to grow. At the present time they are the fastest growing class of chemical compounds in the surfactant field. An outstanding advantage of the non-ionics, which has helped their growth, is that they are compatible with soaps, other types of surfactants, and many other materials which react with and precipitate surfactants of the other classes. Nonionics of the two classic types referred to above first came on the market as "Igepals" and "Tritons." However, they are now sold under many other trade names also.

Additional important types of nonionic surface active compounds are those based upon long chain fatty amines, rosin amines, long chain mercaptans and sorbitan, in each case by reaction with ethylene oxide to attach one or more polyoxyethylene chains to the hydrophobic base.

The fatty diethanolamides constitute an important class of non-ionic surfactants which do not involve the use of ethylene oxide for their preparation. These substances, based upon the well-known Kritchevsky patent (8), are often referred to as "Ninol" type surfactants after the company founded by the inventor. Newer developments in this class will be discussed later.

Miscellaneous types of anionic surface active agents: (a) secondary alcohol sulphate ("Tergitol"): (b) diester of sodium sulphosuccinate.

(a) $C_4H_9CH(C_2H_5)C_2H_4CH(OSO_3Na)CH_2CH(CH_3)_2$ (1937)

(b) $NaO_3S\,CH_2COOCH_2CH(C_2H_5)C_4H_9$ / $CH_2COOCH_2CH(C_2H_5)C_4H_9$ (1936)

III. *Cationics*

Cationic surface active agents, which almost always consist of long carbon chain quaternary ammonium salts, were among the earliest surfactants to be disclosed

in patents (9). Nevertheless, the cationics have not assumed an important place in the surfactant field. There are several reasons for this, first their high cost, and second the discovery made in 1935 (10) that the long chain quaternaries were highly effective germicides. This important application for the products has so far overshadowed other uses, that their development as surfactants has been neglected.

IV. Amphoterics

The amphoteric surface active agents, those containing both anionic and cationic functions in the same molecule, are a small class which is only now beginning to receive the attention it deserves. We shall have more to say about this class later.

Recent Developments

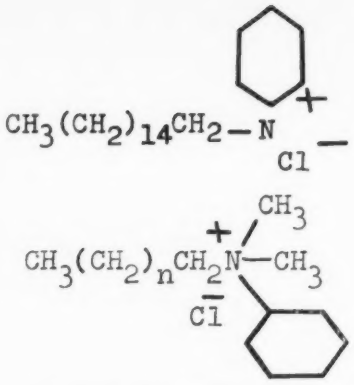
Some indication of the relative importance of each of the major classes we have discussed may be gained from the figures given in Table I. We learn from this that the non-ionics, which ten years ago represented only 10% of the total of surfactants produced, now account for 25%. This growth is accounted for by the versatility of this class of compound and a gradual reduction in their price.

Our discussion of the development of surface active agents has centered around the industrial market where, as we have seen, all of the chemical types now in use were first introduced and where their volume grew to substantial proportions before synthetic surfactants became important in the consumer field following World War II. Experts on surfactants

Table I. Production of Surface Active Agents
By classes — 1958
(100% active basis)

Anionic	978,662,000 lbs.
Non-ionic	341,942,000 "
Cationic	32,146,000 "
Amphoteric	2,364,000 "
Total	1,355,114,000 lbs.

U. S. Tariff Commission, Synthetic Organic Chemicals, U.S. Production and Sales 1958.



Cationic surface active agents

differ as to the size of the industrial market, their estimates ranging from 10% up to 40% of the total market. A recent estimate (11) places the volume of the current industrial market at 451 million pounds presumably on the "as sold" basis. In my opinion this is too low and the above figure should be almost doubled.

When synthetic detergents hit the consumer market, the tail began to wag the dog; what was an insignificant use for the synthetics fifteen years ago has now become their major use. However, only a few chemical types of surfactants go into consumer products, compared with hundreds which find specialized application in the industrial field. Because they constitute the active ingredient in most of the big volume heavy-duty solid household detergents, the alkyl aryls (mostly dodecyl benzene sodium sulphonate) have experienced a ten-fold growth since 1945. In addition to the alkyl aryls, fatty alcohol sulphates, certain non-ionics and alkylolamides make up about all of the surfactant types used in consumer products.

Compared with the period of great chemical activity in the surfactant field from the late 1920's until the outbreak of World War II, the chemical developments of the last ten years have been few indeed. The recent period has been characterized rather by the improvement and modification of well-known types of products and by the utilization of new raw materials which were not available during the earlier period.

One development of major significance during the recent years has been the introduction of a new type non-ionic surfactant, the so-called "block-polymers" (12). In contrast to the older types of non-ionics based upon fatty alcohols or alkyl phenols, the hydrophobic base of the block-polymers consists of polypropylene oxide. Since polymers of ethylene oxide are typically hydrophilic, it would scarcely have been suspected on theoretical grounds that polypropylene oxide could be used as a hydrophobic base. This discovery was the basis of the development.

Block Polymer

$$HO-\ (C_2H_4O)_x(C_3H_6O)_y(C_2H_4O)_zH$$

As is the case with other types of non-ionics, the hydrophilic chains are built up by reacting the base with ethylene oxide and, since the base comprises two reactive end groups, two polyoxyethylene chains may be attached. A very important feature of the block polymers is their extreme flexibility, since not only the chain lengths of the polyoxyethylene groups may be varied but also the chain length of the base. The resulting control over the hydrophilic - hydrophobic balance thus provided makes it possible to vary the properties of the end products almost at will (13). These compounds are sold under the trade name of "Pluronics."

Another important development of recent years was the introduction of a new type of alkylate, polypropylene. The earlier alkane bases for dodecyl benzene sulphonates were made by chlorinating a petroleum fraction and using it to alkylate benzene by means of a Friedel-Crafts reaction. The nine- and twelve-carbon polymers of propylene now made available provided mono - olefinic hydrocarbons with which to alkylate benzene. The first commercial production of alkanes made by this process was began in 1947 although the patents

(*Turn to Page* 105)

Behavior of nonaqueous

Dry Cleaning Detergents

The detergent's ability to carry water in micellar form is shown to be the key to safe and efficient dry cleaning systems

By Ernestine Hirschhorn*
R. R. Street & Co.,
Chicago

THE drycleaning process is concerned with immersion and agitation of water-sensitive fabrics in nonaqueous solvent-detergent systems, to which small amounts of water are added to improve cleaning action. To gain an insight into the phenomena involved, a step by step investigation is necessary of (a) the detergent-solvent systems, (b) such systems containing solubilized water, and (c) three phase systems of detergent solution, fabric and air phase.

Detergents have been shown to exist in colloidal solution in which they aggregate to form micelles. A schematic comparison of detergent micelles, as they might exist in water and in dry solvent systems appears in Fig. 1.

Although shown as spherical units other shapes such as ellipsoids or lamellae are also possible. A detergent molecule consists essentially of a long, lipophilic hydrocarbon chain which is in balance with a smaller hydrophilic end group. Hydrocarbon chains of the hydrophilic micelle which is dissolved in water will associate as shown in Fig. 1a. Hydrophilic end groups of the lipophilic micelle which exists in nonaqueous solvent, will cluster together to resemble the sketch in Fig. 1b. The center of the micelle is capable of solubilizing material of like character: The hydrophilic micelle will solubilize oil and oil based impurities. The lipophilic micelle of the drycleaning system will be able to solubilize water and water soluble soil.

Historical review

As early as 1913 McBain (1) was already using the term "micelles" when referring to aqueous detergent systems. Lawrence (2) used it in 1938 for the first time for nonaqueous systems. Singleterry (3) redefined micelles for our purpose in 1955 as "thermodynamically stable association colloids formed by 3 or more amphipathic molecules," specifically detergents.

Solubilization phenomena and micelle formation of detergents in water as continuous phase have been investigated extensively for over 50 years, but the exploration of nonaqueous systems is of more recent date. To our knowledge, the latest review of literature on nonaqueous systems in general was published in 1958 by Reerink (4), in the Dutch language.

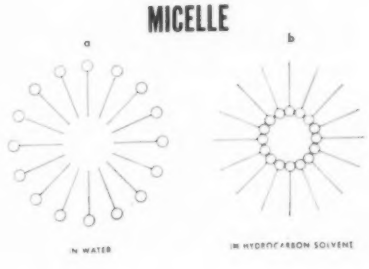
The first basic investigation of systems encountered particularly in drycleaning was published in 1948 by Mattoon and Mathews (5), and later by Phillippoff (6). These authors report on small angle X-ray scattering. Other papers dealing exclusively with systems encountered in drycleaning have since been published by Mathews and Hirschhorn (7) and Fulton et al. (8) in 1953; by Siegel in 1958 (9); by Aebi and Wiebush (10); by Mönch (11); and by Hirschhorn and Mathews (12) in 1959.

Some of the earlier work was reviewed in 1958 by Martin and Fulton (13). In the same year Hess (14) published a critical review of some of the American publications and a summary of work done in Germany along similar lines.

Systems containing "Aerosol OT,"* dodecane and added water were tested by various methods and the results compared. It is impossible to evaluate data obtained by a single method without making several assumptions. Thus, e.g., isolated, uniformly sized spheres are assumed when calculating the micelle radius from ultracentrifugal work. The water core of micelles is assumed to be sufficient to carry a monolayer of detergent molecules. Different assumptions are made in calculations derived from other methods. Considering this limitation in the reliability of deductions as well as experimental difficulties encountered in this type

Figure 1.

MICELLE



*Paper presented at annual meeting of ASTM Committee D-12 on Soaps and Other Detergents, New York, March 15.

*Tradename of American Cyanamid Co., New York.

of investigation, studies by all available methods appeared desirable.

(a) X-ray data

Mattoon and Mathews (5) observed small angle X-ray scattering on 5-25% concentrations of di-2-(ethylhexyl)-sodium sulfosuccinate ("Aerosol OT") in dodecane which indicated existence of micelles in that range. The critical micelle concentration was well below 5%. Scattering intensity decreased gradually with increasing scattering angle. Spherical micellar shape was deduced with a radius about equal to the length of one "OT" molecule. Addition of water increased the radius to more than twice the original length. Radius of these micelles was also calculated from electrophoretic data which agreed with that obtained from X-ray data. Stokes law was used for the calculations, assuming isolated, charged, spherical particles of uniform radius in an insulating medium.

Philippoff (6) deduced from X-ray scattering of "OT"-solutions of 25-75% concentration in dodecane a lamellar brushlike arrangement of the micelles. Although his long spacing increased linearly with increase of the ratio of water to "OT," a result consistent with such micellar shape, the slope was three to four times larger than could be accounted for by a lamellar model. A spherical model, however, would agree with his data also at high concentrations.

Further X-ray work with the same system, published by Siegel (9) in 1958, confirmed the early findings of Mattoon and Mathews as well as those of Philippoff. This author also observed a gradual decrease of X-ray scattering intensity with increasing scattering angle for concentrations of up to 25% "OT." Siegel found lower intensities of scattering at higher concentrations (50 to 75%) with a definite scattering maximum at angles between two to four degrees as previously reported by Philippoff, and a gradual transition between the two forms of scattering with increase in "OT" concentration.

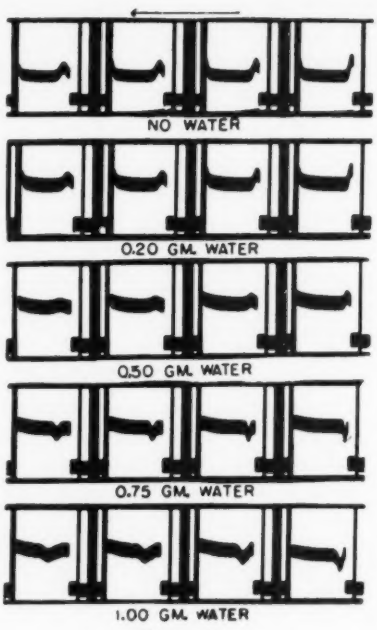


Figure 2.

A single type of micellar structure over the entire range of concentrations is consistent with the observed scattering data, including the observed maxima at the high concentrations. Postulation of special intermicellar arrangements is not necessary. Instead, Siegel proposes a gas type low density arrangement of single micelles in solutions of low concentration changing gradually with rising concentration to a liquid type high density system. Thus, the exponential scattering first observed at the low concentrations definitely points to the presence of "OT"-micelles in dodecane over the entire concentration range.

With the existence of micelles in drycleaning systems established as a fact, further exploration of these nonaqueous aggregates was indicated.

(b) Ultracentrifugal data

Mathews and Hirschhorn (7) and later Peri (15) used the ultracentrifuge combined with accurate viscosity and density measurements to determine the distribution of micellar sizes, weights, shapes and the diameter of "OT" micelles in hydrocarbon solvents. From photographs of the sedimenting boundary at regular time intervals for 1% "OT" solutions containing 0, 0.2, 0.5, 0.75 and 1.0 g water per 100 ml dodecane as shown in Fig. 2, the sedimentation rate was determined experimentally. The single sedimentation peak is a good indication of monodispersity. The last set representing 1 g of water to 1 g of "OT" indicates at least three different sizes due to the three separate peaks. For ideally sedimenting spheres of a single size, particle diameter and micellar weight were calculated from these ultracentrifugal data, which were compared with theoretically calculated micelle sizes for each ratio of water to "OT," assuming uniformly sized spheres with a water core just sufficient to accommodate a monolayer of detergent molecules. The data are shown in Table 1. Theoretical and experimental values for the diameter are in good agreement. Micellar weights agree better with the assumption of an oblate spheroid core of axial ratio 2. In calculating diameter and micellar weights a relatively large factor of 1.25 was applied as correction for pressure-viscosity effects at 30° C. Peri questions this large correction factor, extrapolates his observed sedimentation constant to infinite dilution and applies a pressure correction for the change in solvent viscosity of 6%. However, his calculated micellar weight of 11,800 for "Aerosol OT" in isooctane compares favorably with the value of 14,000 in dodecane as shown in Table 1.

(c) Viscosity data

The influence of solubilized water on micelle structure can be followed by density and viscosity determinations.

Viscosity data of water containing "OT" systems in dodecane appear in the next two figures. Fig. 3 shows the specific viscosity, $\eta_{sp} = (\eta - \eta_0)/\eta_0$, where η and η_0 are viscosity of the solution and solvent respectively, plotted versus differ-

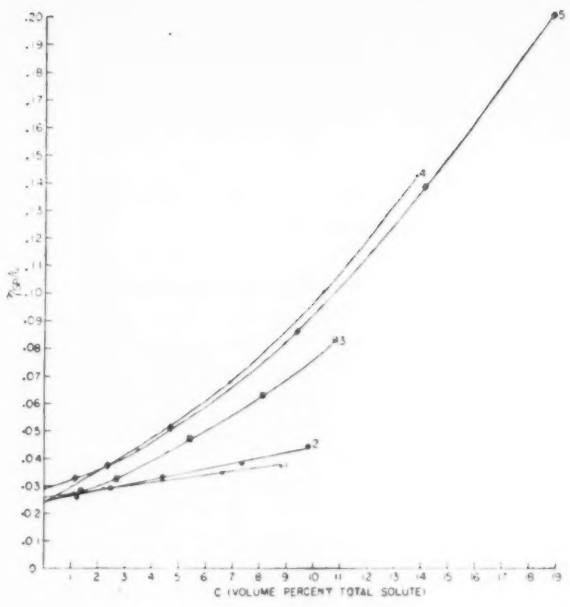


Figure 3.

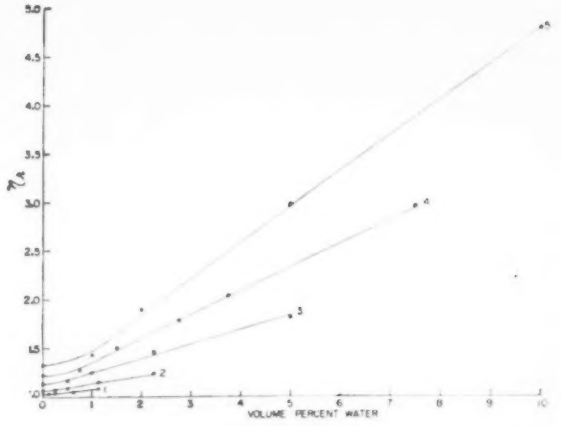


Figure 4.

ene amounts of total solute.

According to Einstein's law for the viscosity of ideal rigid spheres at low concentrations and for ideal conditions of flow $\eta_{sp} = KC$ where $K = 0.025$. Our values at zero concentration, which were obtained by extrapolation agree very well with that law for four of the five water to "OT" ratios measured. This means that in diluted solutions, as encountered in drycleaning (for all but very high water to "OT" ratios), the systems contain spherical or close to spherical particles. Peri's results with "OT" in iso-octane at 25° C. are higher (about 3.2) which would point to divergence of the micellar shape from the spherical. However, he arrives at these values by using Eiler's empirical correction equation. This introduces voluminosity, the ratio of active volume to real volume and a correction factor for nonspherical particles.

Fig. 4 illustrates relative viscosity of "OT" solutions versus volume per cent water for various dodecane solutions of different "OT" content, giving the "OT" content in per cent by volume. Except at very small water contents, the viscosity rise is proportional to the water content for each "OT" concentration.

Mönch (11) made viscosity and density determinations of pure ammonium oleate in carbon tetrachloride. He suggests the existence of spherical micelles at concentrations below 2% ammonium oleate with a change to flat, cylindrical shapes at higher concentrations.

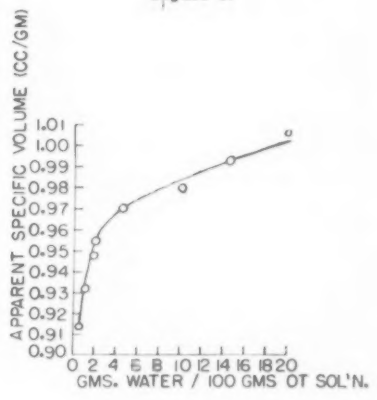
Table I. Ultracentrifugal Data for Dodecane Solutions

Grams/100 ml. of solution		Micelle, spherical model				Micelle, oblate spheroid core, axial ratio 2, calculated mol. weight
		Calculated		Experimental		
OT	Water	Diameter	Mol. weight	Diameter	Mol. weight	
		A.		A.		
1	0.00	—	—	34	14,000	—
1	0.20	37	6,000	35	15,000	8,000
1	0.50	59	47,000	57	60,000	62,000
1	0.75	77	123,000	82	190,000	170,000
1	1.00	95	250,000	99	310,000	328,000

(d) Density data

Accurate density measurements of "OT" solutions containing solubilized water allow the calculation of the apparent specific volume of water. This is plotted for various water additions to 10% "OT" in dodecane (wt./wt.) in Fig. 5. Subtracting the volume of the solution containing the water from the volume of the water free solution and dividing by the weight of water added gives the values for the apparent specific volume of the micellarly bound water core. The extremely low values of 0.91 to 0.95 for water additions of less than 2% indicate strong hydration of the polar groups of the detergent. The sharp change in slope at a ratio of 2% water to 10% "OT," which is 5 moles of water per mole "OT" indicates either that further addi-

Figure 5.



tions of water are made at a bulk density of 1, or that a change may occur in the micelle shape from an oblate spheroid to a spherically swollen one.

(e) Conductance data

Electrophoretic investigations showed that micelles of "Aerosol OT" in dodecane carry a positive electronic charge of less than 1 per micelle. The rather complex relationship of conductance to concentration and water content of "OT" solutions in dodecane is illustrated in Fig. 6. Increase in concentration increases conductance, see curve 1, which represents water free material. Gradual increase in water content shows more irregular changes in conductance (curves 3, 4 and 5). Some commercial detergent mixtures are even more unpredictable. Martin and Fulton (13) tried to explain these data qualitatively. They reasoned that addition of "OT" as well as water to the nonconducting solvent increases the dielectric constant of the system, which would make it a better conductor of electricity, as shown by Kraus and Fuoss (16).

Conductance measurements in nonaqueous systems have not, as yet, contributed much to the understanding of the nature of these micelles. However, the rise in micellar conductance with increased water content has been used successfully to control water content in the drycleaning washer while keeping the concentration of the detergent constant. The importance of micellar moisture control will be discussed in the next section.

Work with "OT"-dodecane-solubilized water systems indicates that at low detergent concentrations—lipophilic micelles consist of a spherical or near spherical water core which is surrounded by a monolayer of detergent molecules. In the absence of water the detergent molecules exist as large aggregates. Solutions containing a low ratio of water to detergent exhibit micelles of uniform size and spherical or nearly spherical shape. Equal amounts of water and detergent

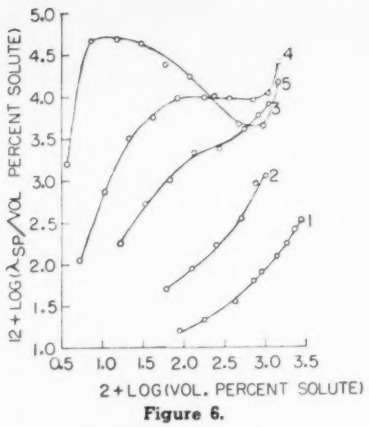


Figure 6.

yield polydispersity. The first 5 moles of water per mole "OT" appear to be more strongly bound to the detergent by hydration or coordinate bonding.

(To be concluded)

References

1. McBain, J. W., *Trans. Faraday Soc. 9*, 99(1913).
2. Lawrence, A. S. C., *Trans. Farad. Soc. 34*, 660(1938).
3. Singleterry, C. R., *J. Am. Oil Chemists Soc. 32*, 446(1955).
4. Reerink, H., Chem. *Weekblad 54*, 721(1958).
5. Mattoon, R. W., and Mathews, M. B., *J. Chem. Phys. 17*, 496(1949).
6. Philippoff, W., *J. Colloid Sci. 5*, 169(1950).
7. Mathews, M. B., and Hirschhorn, E., *J. Colloid Sci. 8*, 86 (1953).
8. Fulton, G. P., Alexander, J. C., Lloyd, A. C., and Schwartz, M., *ASTM Bull.* No. 192, 63(Sept. 1953).
9. Siegel, L. A., *J. Chem. Phys. 29*, 1091(1958).
10. Aebi, C. M., and Wiebush, J. R., *J. Colloid Sci. 14*, 161 (1959).
11. Mönch, R., *Faserforsch. u. Textiltechnik 10*, 129(1959).
12. Hirschhorn, E., and Mathews, M. B., *J. Colloid Sci. 14*, 430(1959).
13. Martin, A. R., and Fulton, G. P., "Drycleaning Technology and Theory" Textile Book Publishers Inc., New York, 1958.
14. Hess, R., *Melliand Textilber. 39*, 404(1958).
15. Peri, J. B., *J. Am. Oil Chemists Soc. 35*, 110(1958).
16. Kraus, C. A., and Fuoss, R. M., *J. Am. Chem. Soc. 55*, 21(1933).

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Powdered Polyethylene

Finely divided polyethylene is now available in semi-commercial quantities from U. S. Industrial Chemical Co., a division of National Distillers and Chemical Corp., New York. The new powdered polyethylene, marketed under the trade name "Microthene," may be used as an additive to waxes and polishes. The material can be used in powder form or in water or alcohol dispersions or pastes.

Introductory price is 65 cents per pound for smaller than 200 mesh and 40 cents per pound for the coarser powder of 50 to 200 mesh.

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Sulfating Agents Compared

Sulfamic acid and sulfur trioxide vapor are compared as sulfating agents for nonylphenol-4-ethylene oxide detergents in an article by Everett E. Gilbert and Benjamin Veldhuis of General Chemical Division, Allied Chemical Corp., Morristown, N. J. Such a comparison, the authors say, is of economic interest since a unit weight of sulfamic acid costs about seven times as much as the equivalent sulfur trioxide vapor obtained from stabilized liquid sulfur trioxide.

Various ethenoxylated long chain alkyl phenols were sulfated with both reagents and compared. Experimental procedure and results are discussed in detail. Performance tests showed nonylphenol-4 ethylene oxide sulfate to be a superior wetting agent and detergent, regardless of the sulfating agent used.

The following general conclusions were drawn by the authors: Per unit weight of sulfur trioxide introduced, sulfur trioxide costs approximately one seventh as much as sulfamic acid and involves about one sixth of the reaction time. Sulfur trioxide gives lighter product color, allows formation of any desired product salt. Sulfamic acid gives the ammonium salt, which can be converted to other salts, such as sodium, only with difficulty. On the other hand, sulfur trioxide gives appreciable foaming during sulfation while sulfamic acid gives none. Sulfur trioxide must be vaporized while sulfamic acid is added directly. Ring sulfonation with sulfur trioxide is appreciable, but none occurs with sulfamic acid. Product performance with the two reagents appears comparable, however.

Detergents in Water and Sewage

By J. David Justice*
Lever Brothers Co.
New York

THIS is the fifth annual report on the research program begun several years ago by AASGP to develop the factual information related to purported effects of household detergents in sewage treatment and water supplies. During the course of this year the emphasis of the work has shifted from university research projects investigating ABS in sewage treatment operations. These projects have largely been completed and the results reported However, some additional work has been carried out during the course of the past year to round out the program and settle some questions which arose during the course of the studies.

U. of Southern California

A fellowship was established at the University of Southern California in 1957. The goal of this study was the development of a quick, simple and reliable method for analyzing water or sewage for alkyl benzene sulfonate. It was hoped that such a method would be sufficiently rapid and simple to be used in an average sewage plant laboratory. Although everyone concerned realized that success in this venture would be hard to achieve, the value of such a method, to practical studies of the ABS problem, appeared great enough to justify the attempt. This work has now been completed but without success.

Many dye-solvent combinations were tried in an attempt to find a system of sufficient selectivity for ABS extraction but which would not be subject to interferences. Some promising combinations were found when ABS and possible interfering materials were evaluated separately. However, under more realistic conditions that might exist in the field, where ABS is present along with many other materials, these dye-solvent combinations were not satisfactory.

University of California

Studies of the effect of operating variables on the removal of ABS during sewage treatment were concluded at the end of the contract period in October, 1959. Subsequently, a final report was prepared and was submitted to the AASGP in January, 1960.

Experimental work performed during the final year of the study was concerned primarily with the removal of ABS by induced frothing, and its disposal by burning and by digestion. Ninety percent removal of ABS was found to be feasible by frothing of either primary settled sewage or activated sludge effluent. The use of activated carbon concurrently with frothing was not beneficial in further lowering the residual ABS content.

The most effective burning technique involved a separate incineration chamber into which froth was extruded from a covered aeration tank. In a pilot scale unit, five to 10 cubic feet of digester gas (75% methane) was required for complete destruction of froth from 100 gallons of primary settled sewage, whereas the smaller amount of froth from a similar amount of activated sludge effluent required three to five cubic feet of gas. These amounts could presumably be reduced somewhat by a carefully designed burner.

Experimentation with flash burning on the liquid surface was performed both by induced frothing with gas alone and with a combination of air and gas. The combination mixture was necessary for adequate frothing and proved successful although not as efficient as the separate chamber process.

University of Wisconsin

A project, concerned with causes and elimination of sewage treatment plant frothing, is just about closed out. During the past year most emphasis has been placed on completing an experiment in which a number of factors have been deliberately varied in order to test the degree of influence each has on frothing. This work is all being done in a laboratory-scale continuous flow activated sludge pilot plant developed under this project.

The factors being evaluated are suspended solids, detention time, aeration rate, ABS in feed, BOD in feed, and nitrogen: BOD ratios. High and low conditions or concentrations of each factor are included. The entire experiment is of a fractional factorial design which will permit evaluation by statistical interpretation. It requires a total of eight separate runs, each taking three or more weeks, plus several check runs. For this reason, plus the fact that during the school year it is not possible to put full time on the project, the experiment is not yet complete. It should be finished very shortly, however.

Because of the design of the program, it is not planned to submit the data to a stringent analysis until the entire experiment is com-

*Report presented at annual meeting of Association of American Soap & Glycerine Producers, New York, Jan. 20.

pleted. Inspection of the individual data for the completed runs, however, shows that under some conditions from 85 to 90% ABS removals are achieved, which is an unexpected bonus to the frothing question. Consequently, the overall data will be evaluated for conditions which maximize ABS removal as well as for those conditions which minimize frothing.

In addition to the activated sludge pilot plant studies, the Wisconsin investigators ran a repeat of the weekly monitoring program on the Wisconsin River at Wisconsin Dells which was first run during the spring months of 1958. The purpose of this monitoring program was to try to determine the cause of a natural frothing problem which had been observed during the spring months each year.

It will be recalled that in 1958 run-off was low, and only minor frothing occurred. This past year, however, some frothing has been evident, the maximum being five to 10 inches. At the time of greatest froth buildup, 0.02 ppm ABS was present in the liquid and 14.7 ppm in the filtered froth. At no time did ABS concentrations rise above 0.03 ppm. Ammonia and organic nitrogen also remained low. Thus, some factor or factors other than the above must have been responsible; air entrainment has been suggested.

Johns Hopkins

A group at Johns Hopkins has worked out techniques best suited to removing small quantities of ABS from drinking water. Variables such as temperature, pH and flow rate were considered and the relative efficiencies of fifteen commercially available activated carbons were evaluated. From 40 to 90 ppm of carbon were required to remove 90% of the ABS. Further study on materials other than carbon which might help in this problem has not been fruitful.

Additional work on foaming has indicated that activated carbon can best be fitted into this picture if it is used to clean up the water after as much ABS as feasible is removed by straight foaming.

Cranston Project

A consulting firm was retained to establish a project at Cranston, R. I. to compare the complete-mixing activated sludge system with the standard sewage plant. The Cranston plant was divided into two halves and one half was converted to a complete mixing system by the installation of weirs and distribution systems. The early work on this project was not conclusive and recent work has been hampered by changes in personnel and difficulties in obtaining some new diffusors which are required to obtain proper air distribution in the aeration tank. It is hoped that the question of the relative performance of the two systems will be answered in 1960.

ABS Analysis Subcommittee

The referee infrared method for ABS in sewage which was developed during 1957 and 1958 was tested successfully on domestic waste and on mixed domestic-industrial waste. A paper describing the method and test results was presented last September at the national meeting of the American Chemical Society in Atlantic City. The paper is currently being submitted for publication in the *Journal of Sewage and Industrial Wastes.*

A recommendation was made to ASTM D-19 Committee on Industrial Water (Task Group on Synthetic Surface Active Materials) that it consider undertaking evaluation of the Hedley short method (1) compared to a conventional methylene blue procedure. This committee will be meeting in late January, and its response to the proposal should be forthcoming shortly thereafter. If D-19 decides not to carry out the evaluation, our subcommittee will reconsider the possibility of carrying out an evaluation on a cooperative basis. The Hedley method is based on principles used by other investigators, but with modifications that reduce interferences by extractable materials. Simple to perform, the method is reported to be reproducible and to give good recoveries of known detergent additions.

Further work of the subcommittee on analysis of ABS entails standby analysis of water samples obtained from various areas.

Ground Water Subcommit.

This committee has been studying the problem of ground water contamination, which occurs in areas in which individual household septic tanks or cesspools are located too close to private wells. Effluents from the septic tanks seep into the ground water supplies, carrying along pollutants not removed by the septic tank action. While a number of pollutants may appear in the drinking water drawn from wells, ABS is the only one the presence of which is obvious, since it produces a light froth at concentrations of about one part per million and up. As a compensation for its being a pollutant per se, it does serve as a warning and an indicator of a broader problem.

The problem of ground water contamination received considerable publicity in Suffolk County, Long Island. A joint committee of county supervisors and the Suffolk County Water Authority prepared a report on this subject. They concluded:

> "The committee feels that the problem of synthetic detergent contamination does not presently pose a threat to the public health in the concentrations now found in drinking water, but it is more an esthetic consideration . . . "

To assist the subcommittee in its work the Soap Association has retained a professional sanitary engineer. The subcommittee plans to follow outside research projects in this area. Indications of such studies are that (1) ABS does not promote the movement of bacteria through soil and (2) ABS

is either partially absorbed or partially broken down as it passes through soil.

Subcommittee on Plumbing

During the year 1959 difficulties were reported from several apartment houses where suds were backing up into fixtures, and where detergents were being blamed for the difficulty. In one case, involving a multiple-story apartment house in the New York City area, a meeting was held with the architect and the plumbing engineer to review details of the plumbing, as well as the pertinent facts concerning the problem. Apparently this difficulty is generally associated with long horizontal runs of pipe at the lower level, below the primary connection to the main vent stack. It was agreed by all parties that this installation represents a minimum cost effort, and that slightly larger stacks could have been used, although the present installation does meet the minimum requirements of the code in effect at the time of construction.

Phosphates Subcommittee

The Phosphates Subcommittee has been on a standby basis during the entire year of 1959. The only activity involved a brief investigation of a report by a water company of alleged foaming due to phosphates. The report was based on insufficient information. Subsequent detailed analyses of the various water supplies indicated that the foaming was due to excessive amounts of ABS in certain areas, mainly near sewage outfalls. Phosphate levels were extremely low and of the same order of magnitude as found in our survey of Illinois streams. This company does not appear to be unduly concerned about the generally low level of phosphates and ABS in their normal supplies and the matter may be considered as closed.

Drinking Water Analysis

A project was set up to determine the ABS content of drinking water. Since it was economically unfeasible to analyze the drinking water of all major U. S. cities, a cross section panel of cities was developed with representative types of water supply. Types represented were wells, lakes, uncontaminated streams, and contaminated streams (with water receiving continued use and waste disposal along the stream). These 32 water supplies serve an estimated population of 25 million.

The project was set up for three separate analyses to be made of each drinking water source. The first two of these three series of analyses have been completed. In the first series for which samples were collected from mid-July to mid-August 1959, the average ABS content was 0.034 ppm with samples ranging from 0. to 0.14. The second series, with samples collected in late October and November, had an average ABS content of 0.025 ppm with individual samples ranging from 0 to 0.08. A tabulation showing the average ABS content of the various sources tested appears in Table 1.

Table 1.

	Average ABS Content	
	Series A	Series B
Well supplies	0.053	0.015
Lake supplies	0.02	0.015
Sewage-free sources	0.003	0.015
Mississippi River	0.02	0.038
Missouri River	0.038	0.014
Schuylkill River	0.08	0.04

The third series of samples will be taken and analyzed in the late winter.

Taste and Odor

Statements continue to appear in the press that ABS makes water taste oily and fishy. Subcommittee members carried out in their own laboratories an investigation of the level required before ABS would be detectable by a panel. Results, which were quite similar in all laboratories, revealed that many times the level of ABS encountered in ordinary water supplies would be required before its presence could be detected by either taste or odor. The threshold level for taste was in excess of 40 parts per million. The threshold for odor was somewhat higher. One panel found that no taste or odor could be detected at 50 parts per million for ABS but that the presence of a built packaged detergent containing perfume could be detected at 150 parts per million. This is a level high enough to give 30 ppm of ABS. This result may

(*Turn to Page* 174)

About the Author . . .

J. DAVID Justice, whose report of the research program of the Association of American Soap & Glycerine Producers to develop factual information related purported effects of household detergents in sewage treatment and water supplies appears on this and adjacent pages, is vice-chairman, Technical Advisory Council AASGP Steering Committee. He is research manager (chemical and physical) at the Research and Development Center, Lever Brothers Co. in Edgewater, N. J. Dr. Justice joined Lever in 1954 as senior research associate. Previously he had been with Carbide and Carbon Chemicals. In Dec., 1954, he was named to his present post.

Lester Conrad head of American Cholesterol Products, Inc., is one of the founders of the 21 year old concern, bears title of executive vice-president and technical director of the firm.

It All Began With Lanolin

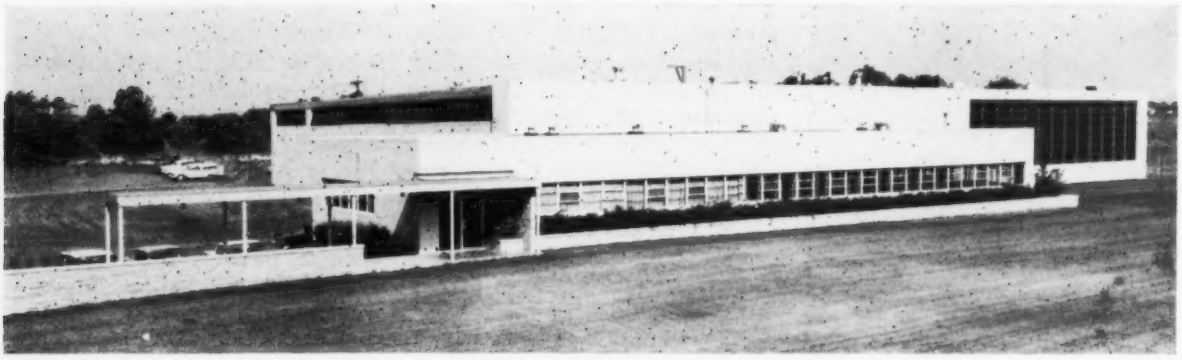
Highly specialized lanolin derivatives and individual service tailored to the customers' requirements are American Cholesterol's formula for its success

A 20-acre site with a future, located at Edison, N. J., is the home of American Cholesterol Products, Inc., pioneer in acetylated lanolin derivatives. The firm, which is 21 years old this year, has been in this promising location for the past three years. Promising, because it is easy to see that its value must have appreciated greatly since it was chosen and that it will continue to do so in the future. The site is strategically located near major trucking routes and near the railroad. In the immediate vicinity Revlon has built a plant and a number of other major industries have settled since American Cholesterol moved there from its previous home in Milltown, N. J.

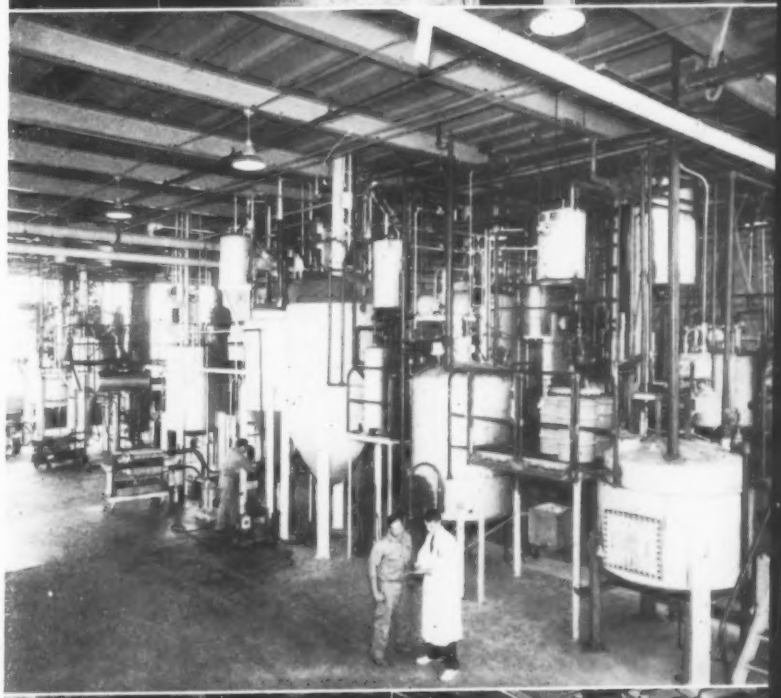
Wise choice of the location and its generous proportions allowing for future growth are typical of forward looking Lester Conrad, founder and head of the firm. American Cholesterol's operations are housed in an attractive modern building in landscaped surroundings. The main floor, plus mezzanine, provide close to 45,000 square feet of floor space for offices, both general and private, a sizeable library and conference room, laboratories, production, storage, and ancillary facilities.

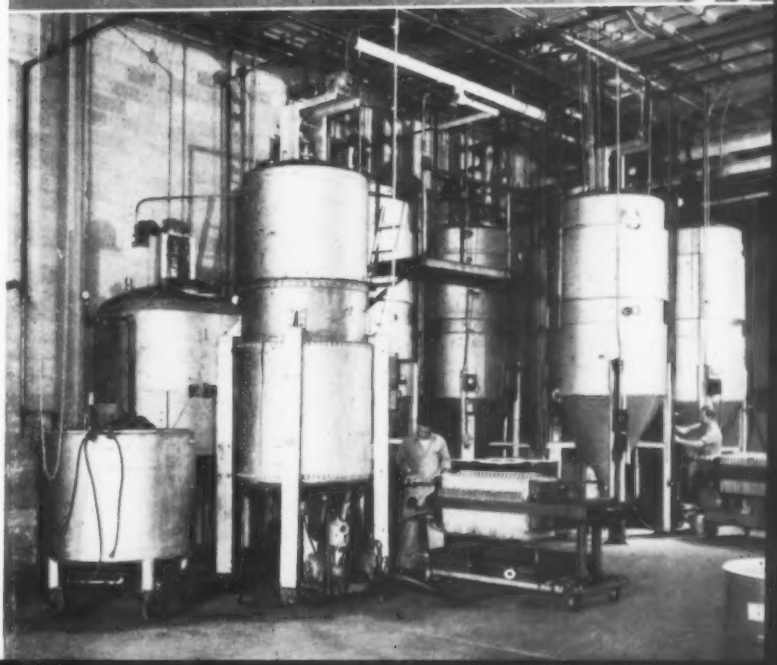
Entering the plant the visitor is struck by the light and cheerful character of the interior and by its meticulously groomed appearance. Heart of the entire enterprise is the laboratory. American Cholesterol employs 30 persons, 10 of whom are technical personnel, headed by Dr. Kalmen Motiuk, director of research, and Henry Maso, director of technical services. Dr. Motiuk has been with the firm

Modern plant in Edison, N. J. houses American Cholesterol's offices, production facilities, laboratories, warehouse.



Production facilities at American Cholesterol's Edison, N. J., plant include approximately 30 reactors and ancillary equipment. Shown here are reactors being checked (top); a general view of the manufacturing section; and final operations on batch of "Amerchol" emulsifying agents (bottom).





for the past 10 years. Mr. Maso came to American Cholesterol three years ago from Johnson & Johnson.

The laboratory's supreme importance is rooted in the nature of the firm's business, namely manufacture of highly specialized products tailored to the industrial consumer's individual needs. In addition to selling products, the firm provides technical service. This takes two forms. The customer may send either his formulation or only his requirements to American Cholesterol, where the technical service laboratory will conduct the necessary research, development and testing work to either develop a new product or iron out formulation "bugs" using, of course, American Cholesterol's modified lanolin derivatives. In addition, the laboratory develops and tests a vast number of formulas, based on its products, which are sent to actual and potential customers as promotion or free service.

American Cholesterol's customers include a wide variety of manufacturers of soap, shampoo, toilet goods, pharmaceuticals, and other chemical specialties. For this clientèle the firm makes:

"Amerchol" non-ionic surface active emulsifiers and emollients;

"Modulan" acetylated lanolin, USP, produced by American Cholesterol's own patented process;

"Acetulan" water thin liquid fraction of acetylated lanolin alcohols;

"Solulan" series of water and alcohol soluble ethoxylated lanolin derivatives;

"Ricilan" liquid wax esters derived from lanolin and castor oil;

"Polylan," derived from lanolin alcohols and linoleic acid;

Spacious laboratory is heart of American Cholesterol's operation, performs research and development work on firm's own products and on behalf of customers.

Isopropyl lanolate; and a number of other products.

All of these materials are suggested as superfatting agents in soaps, synthetic detergents, shampoos, and related products. Most of them exhibit foam stabilizing properties and all are hypo-allergenic. Nearly all of them find use as plasticizers, softeners and co-solvents in aerosol formulations of hair sprays, shave products, etc. Some of these materials are incorporated in insect repellents and other pharmaceutical and personal products for their film forming tendencies and substantivity.

Another phase of the development laboratory's task is tailoring of basic materials to rigidly stated requirements of some major customer who will use them in an undisclosed application. As Mr. Conrad puts it: "Some of the big ones just give us the specs. We make the stuff, however odd some of the requirements may be. And we never learn where the material actually goes, and," he adds with a smile, "we ask no questions."

In addition to all this service and compounding work, the laboratory group carries on a good deal of research devoted to the creation of new materials, improving American Cholesterol's established products, and finding new applications for them.

Next to the main laboratory is a room lined with shelves for products undergoing storage tests. Waterless hand cleaners, both jelly and cream type; all types of shampoos, liquid, cream, medicated and plain; shave cream; and innumerable other compounded toilet and pharmaceutical specialties are assembled in this small room.

Production facilities include about 30 chemical reactors plus accessory equipment. Patting one of the shining reactors Mr. Conrad points out that they are stainless steel, "just like a jewel." This attitude sums up the spirit of personal pride pervading the entire plant.

Production is carried on as a continuous series of batch operations. About a dozen people are employed in this phase of the enterprise. Ample storage and warehousing facilities are located partly in the main building. The remainder are housed in a detached building and in an outside shed. The plant has its private well and waste treatment system. It is equipped to recirculate its water but this has so far not been found necessary.

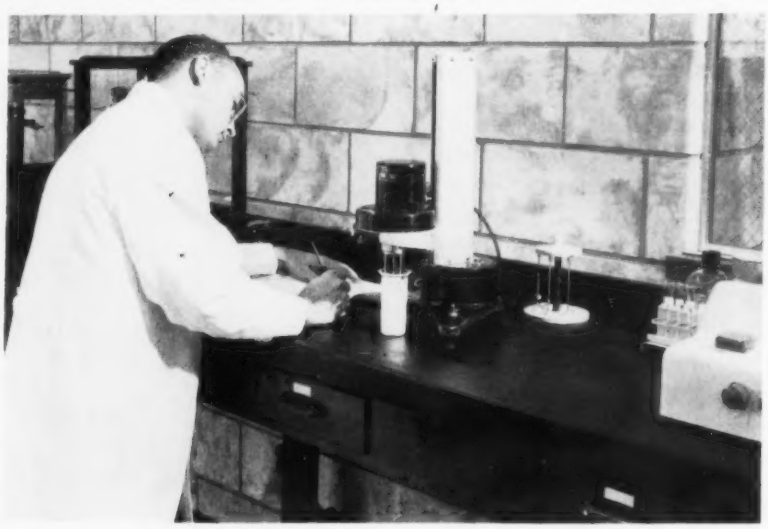
Practically all shipping is done by truck.

In addition to its toilet goods and pharmaceutical business, American Cholesterol, two years ago, founded Chemactants, Inc., an associate operation supplying the polish, insecticide, textile, paint, and metal fabricating industries. One of its products, "Chemactant A-5," is designed for incorporation in wax, polish and cleaner formulations. Others have anticorrosive properties and are used in various industrial specialties.

Lester Conrad, founder and *spiritus rector* of both enterprises, bears the title of executive vice-president and technical director of American Cholesterol Products.

(*Turn to Page* 103)

Technical personnel account for 10 of the firm's 30 employees. Development and formulation work on lanolin derived emulsifiers is main task of laboratory.



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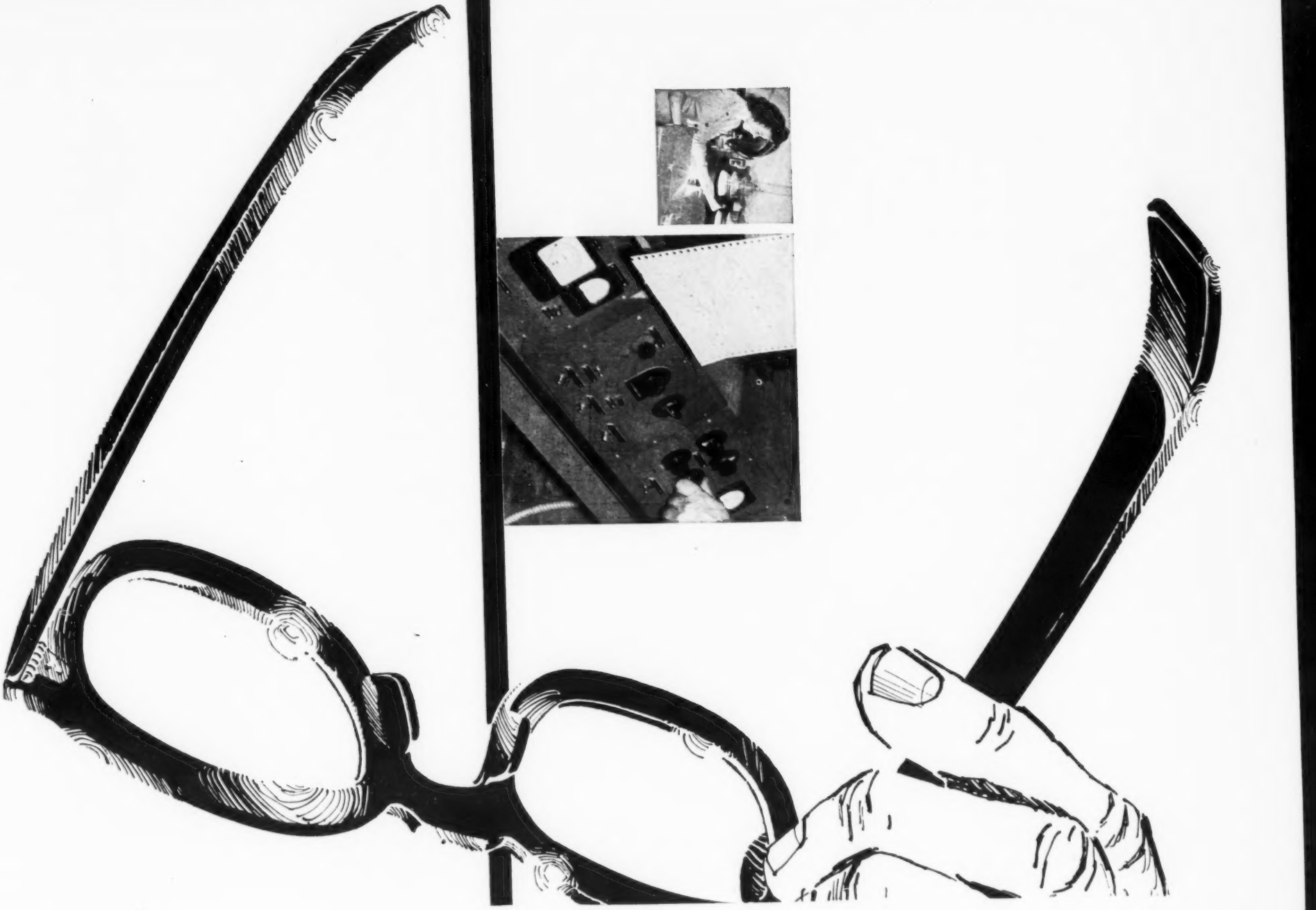

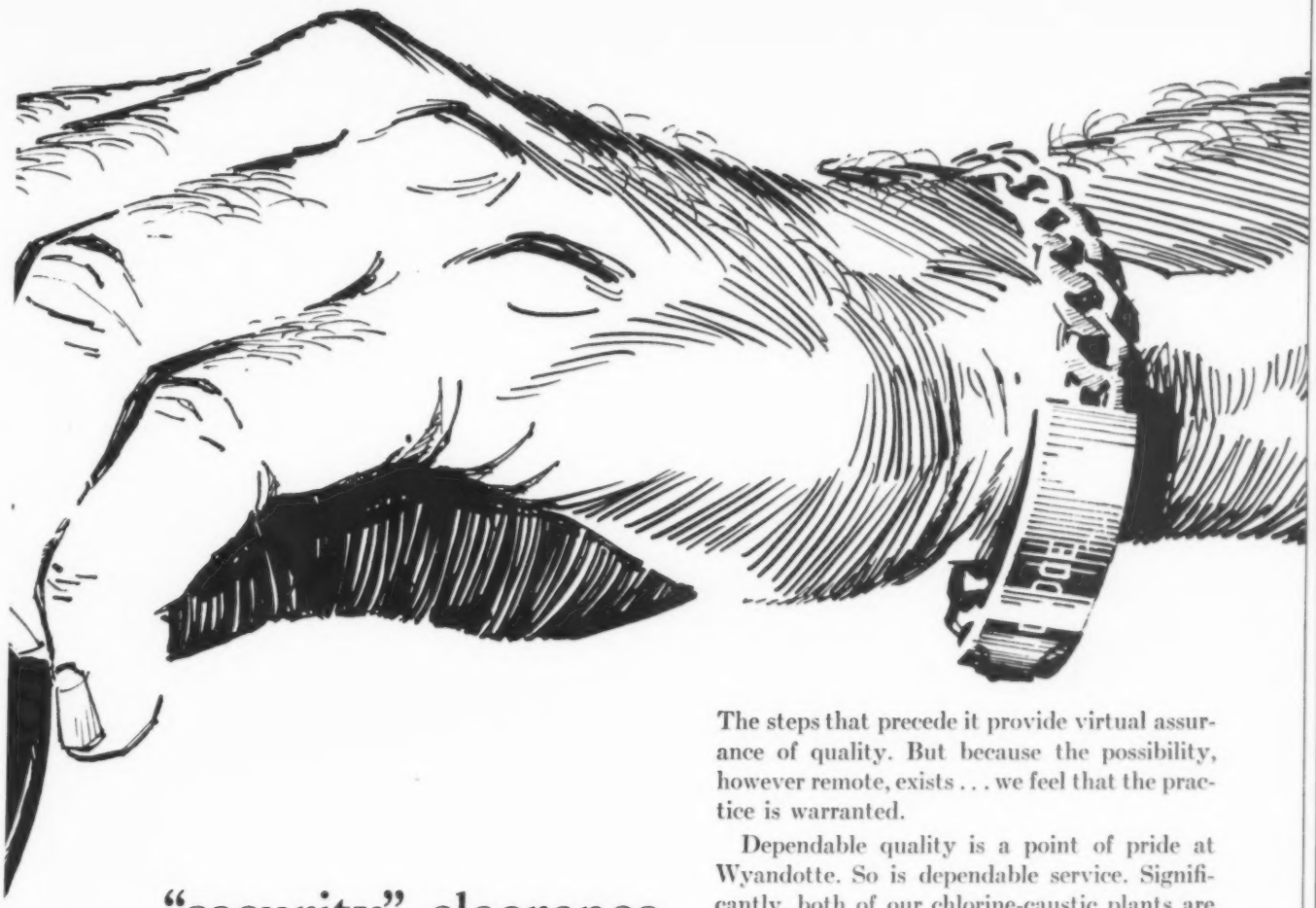

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Arthur W. Schubert, formerly vice president of Emery Industries, Inc., Cincinnati, was elected president June 24, to succeed John J. Emery, who becomes chairman of the board.

Eastman now offers polish formulators 7 basic types of polyethylene

New Epolene resins enable you to formulate broader range of liquid and paste polishes

The wide range of physical properties now available in Eastman's Epolene series of low-molecular-weight polyethylene resins provides formulating flexibility never before possible. For with the addition of three new resins (Epolene LVE, HDE and HD), polish makers can choose now from among seven different types to improve existing formulations or to develop new products.

Epolene resins produce self-polishing floor polishes that exhibit high gloss, anti-slip, water-spotting resistance and rebuffability. Emulsions of up to 40% solids can be prepared. Properly formulated, polishes made from Epolene are low in color and do not darken or turn yellow. Neither do they build up color with repeated applications.

Choose from either emulsifiable or non-emulsifiable types to obtain the right formulating characteristics and performance properties for your equipment and service.

Epolene E *emulsifiable* • Epolene E produces water-emulsion floor polishes that exhibit an excellent balance of high gloss, hardness, durability and good resistance to water-spotting, scuff and dirt pick-up. Ideally suited for heavy traffic, polishes made from Epolene E exhibit extreme toughness due to its higher molecular weight.

Epolene LVE *emulsifiable* • Lower in melt viscosity than the other emulsifiable Epolene resins, Epolene LVE has somewhat better handling characteristics and is the easiest to emulsify. It is softer than other resins in the series, too, and therefore may be expected to contribute better anti-slip properties and rebuffability to floor polishes made from it.

Epolene HDE *emulsifiable* • The first high-density emulsifiable polyethylene available, Epolene HDE is much harder than other resins in the series, yet quite easy to handle. A film of unmodified Epolene HDE emulsion is almost as hard as a film from a finished floor-wax formulation (rebuffable type). This increased hardness is due not only to the nature of this high-density polyethylene, but also to the fact that it is more compatible with oleic acid than are other emulsifiable polyethylenes. Epolene HDE restores rebuffability to polymer-containing polish formulations without sacrificing hardness.

Epolene N *non-emulsifiable* • Epolene N can improve significantly the properties of paraffin, microcrystalline or other waxes and is easily blended with these materials. It can replace part or all of the hard waxes in solvent paste polishes, for example, automotive polishes. Such polishes are characterized by low color, excellent hardness and gloss, and remarkable durability.

Epolene LV *non-emulsifiable* • Epolene LV and Epolene N are useful in similar applications. The LV type is softer than Epolene N, however, and because of its lower melt viscosity is somewhat easier to handle.

Epolene HD *non-emulsifiable* • An extremely hard material, Epolene HD is nevertheless easy to handle because of its low melt viscosity. It has a high softening point, and may be blended with waxes to increase their melting points. Epolene HD has a higher density than the other non-emulsifiable polyethylenes in the series.

Epolene C *non-emulsifiable* • Higher in molecular weight (7000) but lowest in density (0.907) of all the Epolene resins, Epolene C may be used in modifying waxes to increase melting points or to improve toughness and gloss.

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Epolene HDE	1500	455	0.956	1
Epolene LVE	1500	400	0.939	5
Epolene N	2500	2500	0.928	1
Epolene HD	1500	340	0.938	0.5
Epolene LV	1500	360	0.925	3
Epolene C	7000	16,000	0.907	7

If you are using low-molecular-weight polyethylenes in your polishes, investigate the complete Epolene series. Your Eastman representative will gladly explain the advantages of each of the resins in the series and will show you how to realize the most profitable use of them in your formulations. Ask him for specific formulating assistance and about the new time-saving, cost-cutting emulsifying technique developed at our laboratories.

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AEROSOL SEMINAR

Packaging Institute's Seminar on Aeroso Technology hears questions answered by panel consisting of marketers, loaders and container, valve and fragrance suppliers

ALL components of the pressure package and many problems involved in wielding them into one efficient unit were scrutinized at the Packaging Institute's seminar on aerosol technology. One of a series of four professional seminars sponsored by P.I. the all day session was held June 1 at the Statler Hilton Hotel in New York City.

Edward G. Penn of Riegel Paper Corp. was program chairman; Fred T. Pickerell, senior buyer at Schering Corp. and chairman of P.I.'s aerosol committee, acted as moderator and posed questions to the 18 man panel consisting of representatives of supplying and consuming industries. Questions were submitted in advance of the meeting and during the lunch period.

Members of the panel included: Jean W. Baer, Sprapak Chemicals, Inc.; Charles E. Beach, Stalfort Pressure-Pak, Inc.; John Beacher, Avon Products, Inc.; Walter C. Beard, Risdon Manufacturing Co.; L. G. Cannella, Continental Can Co.; Victor DiGiacomo, Givaudan-Delawanna, Inc.; J. J. Gregory, Newman - Green, Inc.; C. D. Hollopeter, Owens-Illinois Glass Co.; A. R. Marks, Wheaton Plasti-Cote Co.; Russell McGhie, Colgate-Palmolive Co.; Francis A. Mina, Reed Carnrick Co.; Ralph Minervino, Metal Fabrications, Inc.; John Palmer of Peerless Tube Co.; H. E. Peterson of Peterson Filling & Packaging Co.; Joseph C. Pizzurro, Precision Valve Co., H. R. Shepherd, Aerosol Techniques, Inc.; Bradford K. Smith of Nestle Co.; and Sigmund Was of Emson Research, Inc. As may be seen from this list, makers of containers, valves, and basic materials, contract fillers and their customers, as well as captive fillers were represented. As might be expected, controversy was lively and discussion pointed.

After a brief introduction Mr. Penn turned the meeting over to Mr. Pickerell, who called on Dr. Mina to explain the basic principles of the aerosol, to set forth the differences between two and three phase systems, and to indicate their respective spheres of usefulness and special problems.

Cost differentials and other pros and cons of drawn versus three piece soldered metal containers were discussed. Mr. Cannella indicated that the extra cost of making the heavier, drawn can might be whittled down by new machinery. On the other hand, new production techniques and improved soldering compounds had upgraded strength and other performance characteristics of the lower priced three piece container, he said.

Questioned on aluminum pressure containers, Mr. Palmer pointed out that they are drawn "Crown" type cans with tolerances controlled to plus or minus 3/1000 inch. This compares with 5/1000 to 10/1000 in most steel containers.

P.I. aerosol seminar panelists, left to right: Russell McGhie, Dr. Francis A. Mina, Ralph Minervino, John J. Palmer, Harry E. Peterson, Joseph C. Pizzurro, H. R. Shepherd, Bradford K. Smith and Sigmund Was. Fred Pickerell was moderator.

This turned the attention to tolerances in glass containers. Being a molded material, glass can, of course, not lay any claim to achieving such close tolerances. Mr. Hollopeter reported, however, that production techniques are constantly being improved and tolerances are becoming smaller.

On the question of uncoated glass aerosol containers Mr. Marks cited drop tests made by his firm results of which are not in favor of this type of container. Whereupon Mr. Shepherd remarked that a good many of them were being filled and used every day. Mr. Marks said that the drop test results could be obtained from Wheaton upon request. Mr. Beacher of Avon reported that morale trouble was apt to develop among women employees in an aerosol loading plant when a few coated bottles exploded in the bath. He expressed apprehension as to what might occur in the case of uncoated glass bursting.

Mr. Hollopeter and Mr. Marks were asked for the difference in basic claims for Owens-Illinois and Wheaton coated bottles, respectively. O-I's coating is bonded to the glass, Mr. Hollopeter pointed out. He mentioned the so-called "ring neck" feature of the O-I bottle, (actually a gap of uncoated glass at the top of the container) which permits detection of a cracked neck in the water bath, an acute problem particularly in nitrogen pressured units.

The Wheaton bottle features a nonadhering coating or sheath of plastic. This utilizes fully the elasticity of the plastic in the case of expanding gases, Mr. Marks pointed out. In addition, the Wheaton coating has vents through which the gas can escape.

The two representatives of glass bottle makers were asked jokingly by Mr. Shepherd when their industry expected to develop an economic and safe coating for all glass bottles, including soda bottles and other items. Mr. Marks said that Wheaton was working "hard" on such a coating; Mr. Hollopeter reported that Owens-Illinois was developing glass packages of remarkable resilience. He reminded the audience that present fabricating techniques permitted the use of no more than one per cent of the inherent strength of glass. When the industry finds a way to utilize 10 per cent of its potential strength, glass will serve as a structural material and will answer the most stringent requirements.

Another question dealt with the proportion of rejects in glass filling. No hard and fast answer was given owing to the many variables involved.

Valves Interchangeable

A question whether valves can be used interchangeably on Wheaton or O-I bottles was answered affirmatively. According to several panelists, collet crimping is preferable to the rotary or spinning method when processing glass containers. Crimping heads are not interchangeable between different makes and ferrules also differ. However, all valves may be used in either collet crimping or rotary sealing processes, Mr. Beach said. Mr. Pizzurro added that steel ferrules lend themselves more readily to crimping than to roll sealing.

Mr. Shepherd stressed the importance of narrowing specification limits in glass containers. He raised the question of head space in uncoated containers and its unfortunate psychological implications in the public's mind where it may be regarded as evidence of slack fill. He called for different molds to make head space less conspicuous. He reported that his firm sends container samples to the valve maker before any final decision on a production run is made. Weight and distribution of plastic coated bottles should be more tightly controlled to facilitate other phases of product control, he believes.

John Beacher asked Mr. Marks what he considered normal headspace allowance. Fluorinated hydrocarbons require about 15 per cent, compressed gases about 25 per cent he was told. Two considerations must determine head space, according to Mr. Shepherd: safety and product evacuation. The correct answer to both requirements is determined by the expansion properties of the propellant gas at certain temperatures, which must be established by tests, which his firm carries out at 200 to 250°F.

The problem of propellant or product leakage during shelf life was discussed by Messrs. McGhie, Pizzurro, and Peterson. Compressed gases present a very special leakage problem. Containers were judged to be the "culprits" more often than valves. A 1½ to five gram weight loss is the rule during a three year shelf test, Walter Beard reported. This, he said, is not critical in a 12 ounce package but in a small package it might assume significance.

"What percentage of 'duds' can one expect?" was answered by Mr. Smith with an estimate of 0.3 to 0.4 per thousand units. Changes in the product during storage are a frequent source of valve and other troubles, in Mr. Gregory's opinion. Mr. Peterson said that 99.5 per cent of his plant's production was "guaranteed."

The question of how far

More P. I. panelists, left to right: Jean Baer, Charles E. Beach, Jr., John Beacher, Walter C. Beard, Leonard G. Cannella, Victor DiGiacomo, Joseph J. Gregory, C. D. Hollopeter, A. A. Marks, Edward G. Penn, Fred T. Pickerell, who posed questions.

formulation contributes to leakage was put to Mr. DiGiacomo, who stressed the number of variables involved and the importance of compatibility tests. Mr. Beacher reported that 90 per cent of difficulties are connected with valve troubles. Product concentration and other aspects of formulation are frequently at fault. He reported that 96 per cent of all returns occur after 18 months, which indicates the importance of shelf testing.

Dr. Mina asked whether anyone had found a good accelerated test for leakage. Colgate uses a helium leak dectector with good results, Mr. McGhie reported. Jean Baer said that accelerated tests frequently yield misleading results. Mr. Peterson described a corrosion test used by his firm which exposes aerosol units alternately to 130°F. and to low temperatures.

Relationship between spray characteristics and valve construction were considered. Spray rate depends on both valve dimensions and product rheology. Prediction is 95 per cent an educated guess, according to Mr. Pizzurro. The same applies to metered valves, Mr. Was confirmed.

Mr. Minervino was questioned on possible electrolytic effects between steel and aluminum and on the range of stock caps available. Possible product contamination of plastic valve assembly was discussed.

Food Aerosols' Future

The future of aerosols in the food field was discussed. Mr. Smith said that initial excessive optimism as to the future of pressure packaged foods overlooked tight profit structure of the food industry. Furthermore, gadgets – in his opinion – are no attraction to the ordinary housewife. To her, novelty is no justification for higher price. The huge volume involved in foods is, of course, enticing. In the case of chocolate syrup the overwhelming plus in convenience justifies the extra cost of the pressure package, Mr. Smith said. Mr. Baer stated that possibilities of expansion do exist in the food field, and particularly in fancy foods. Dr. Mina added that aerosol packaging has a place in the food field. It offers brand protection, making refilling of labelled containers with inferior products impossible, safeguards cleanliness and protects against oxidation.

Responsibility for container cleanliness rests with the filler, Mr. Cannella pointed out and mentioned the special problem in the case of aerosol containers, where foreign matter particles may clog valves.

Food spoilage by residual matter left on valve housing or actuator can be minimized even in such critical products as whipped cream, Mr. Smith said. Correct design of cover cap and bacteriostatic product formulation are the main safeguards.

"Does the net content in aerosols include propellants" was answered by Mr. Peterson with a most definite "yes." He pointed out that the propellant is an integral part of the product and referred to a paper which he will present before a meeting of weight and measure officials supporting this reasoning. The paper is based on work done by a CSMA committee which he heads.

Dr. Mina explained that in the case of pharmaceuticals the share of concentrate per metered release must be declared to ensure correct dosage.

Mr. Beach was asked to compare pressure filling and cold filling. He said that cold filling involved chilling to from 0°F. to –40°F., depending on the product. The method gives a high rate of production and minimizes loss of gas. Large capital investment is required for installation of a cold filling line, according to Harry Peterson, but production rates are high, about 200 cans per minute. Rotary fillers and other improvements, however, are bringing pressure filling to the fore. A line which is adaptable to both methods is the best investment, according to Mr. Peterson. Mr. Beach added that cold filling is preferable for glass containers. Mr. DiGiacomo pointed to the inherent difficulties of chilling aqueous systems, which must be pressure filled. Furthermore, certain concentrates, for instance in the essential oil field, would suffer from chilling.

Component Costs

Asked, when the cost of bottles might come down, Mr. Marks pointed out that two ounce bottles had been reduced in recent years from 15 to 8 cents, but that glass would probably always remain more expensive than metal.

Mr. Pizzurro said that valves for bottles are more expensive than valves for cans simply because of volume. When more bottle valves are required the price will come down. Mr. Gregory pointed out that the valve is the only functional part of the pressure package. Higher demands are made on finish of bottle valves, on anodizing, cover caps, etc. Mr. Beard reminded the audience that the price of an aerosol valve had dropped from 13 cents to 2½ cents within the last 10 years.

Approximate cost of filling operation and components was discussed. Mr. Beach stressed the importance of volume to price. Mr. Peterson added ease of filling as another important variable. Small containers cost anywhere from 2½ to 15 cents, larger containers cost more, Dr. Mina pointed out. Cost of propellant per unit depends on type and quantity required. Propellant 11/12 costs about 28 cents per pound, 114 costs 65 cents per pound. To this must be added the cost of the concentrate, the valve, the cover cap. Jean Bear said that for every unit retailing for $1.00 the producer gets 45 cents; which must cover production and advertising costs plus his profit. The remainder goes to the retailer and wholesaler.

Price quotations by custom

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Insecticidal and Toxicological

A very toxic chemical for insects and men, 0, 0 Dimethyl 2, 2-Dichlorovinyl Phosphate possesses excellent properties for pesticides.

THE many people who have used DDVP for the control of the common house fly undoubtedly would little disagree that this chemical is an unusual and unique insecticide. Probably its most apparent property is best, if unscientifically, described by the remark, "you put it on the floor and the flies die on the ceiling." In fact, it was this vaporous property that led to the discovery of DDVP by Buren, Sedlak and Pearce (1) in 1954 during their comprehensive testing on the volatility of organic phosphate insecticides.

Probably B. B. Stoller in 1956 was the first to market DDVP commercially in the United States. His spray preparation was designed primarily to control the phorid fly in mushroom houses. Fly baits containing DDVP as the toxicant appeared on the market in 1957, and in June 1957 DDVP was first approved for use in tobacco warehouses as a spray or fog to control the cigarette beetle and tobacco moth.

The Japanese registered DDVP for household use in space sprays during 1958. Mostly, these sprays consisted of 0.3% DDVP in kerosene. In 1960 the U. S. Department of Agriculture, with the concurrence of the U. S. Public Health Service, has approved the use of DDVP by pest control operators as a spray for control of flies, cockroaches, flies and brown dog tick.

No less than 26 papers have appeared on DDVP during the six years since its discovery and in these tests conducted either in the laboratory or field 19 different insects were reported on.

Because of the relatively restricted uses that have been permitted DDVP, it is not a well understood insecticide today. In fact, it is relegated to the very toxic substances by most entomologists. Although there is no question that DDVP is a very toxic chemical, both for insects and man, nevertheless it possesses some excellent properties that are most desirable in insecticides.

Vaporization of DDVP

Although the vapor pressure of DDVP approximates 0.1 mm at 30°C., volatilization is such that about 2% to 7% of the total dose of DDVP is in the air several hours after application. Data in Table 1 show air concentrations of DDVP in a closed barn treated with 6 grams of the chemical in water sprinkled on the central walkway. The rate of application was 0.5 mg. DDVP/ft^3. The values for air concentrations agree satisfactorily with those obtained in tobacco warehouses by Durham *et al* (2) and in steel drums by Tracy (3).

Because DDVP volatilizes it is necessary to consider the volume of treated areas rather than the surface areas alone, as is done with most insecticides. In fact, the volume used of a 0.5% or 1.0% DDVP spray should be sufficiently precise so that not more than 1 gram of DDVP is applied in 2,000 ft^3, unless a greater concentration is specifically required and special precautions or methods are exercised in the application.

DDVP is not a true fumigant in the sense of the lighter gases, e.g., HCN or methyl bromide. The molecule is relatively heavy, having a molecular weight of 221. It is probably for this reason that its fumes have poor penetrating powers. DDVP vapors do not penetrate into tobacco packed in hogsheads (4) nor into bulked grains or piles of sacks containing spices and other substances. Just recently Dierberger (5) in Brazil found that DDVP vapors failed to penetrate piles of bagged coffee beans even though 10 mg. DDVP/ft^3 was applied in a closed warehouse and examined 48 hours later. Only about 50-86% kills were obtained in the tests, although the

Table 1. Concentrations of DDVP in the air of a closed stable treated daily with 0.5 mg. DDVP/ft^3.

Days stable treated	Air sample hrs. after DDVP applied	Conc. DDVP micrograms per liter air	% DDVP in air Y/L 17.7
11	2-3.5	1.390	7.8
11	12-13.5	0.357	2.0
12	22-24	0.240	1.4
22	2-3.5	1.480	8.4
22	22-24	0.350	1.9

Properties of DDVP

By Ralph L. Tracy*,
Norda Essential Oil & Chemical Co.,
New York City

adult coffee bean borer is known to be susceptible to DDVP vapors.

It is expected that DDVP vapors are readily absorbed on to surfaces but are released more slowly than are the light gases. This effect was noted by Durham *et al* (6) in a Hazleton chamber and in our laboratory on gunney sacks used for wrapping Turkish tobacco.

One significance of this behavior is that considerably longer residual action can be obtained under certain conditions than is commonly conceded for DDVP. Usually, DDVP sprays are effective for 1 to 5 days after application, whereas some absorbent materials treated with DDVP may remain insecticidal for 3-4 weeks.

Such chemical behavior obviously necessitates that pest control operators give conscious consideration to vapor adsorption on various objects when DDVP is used in closed areas or in restaurants and homes. In other words, overdoses of DDVP should be avoided even though it may seem that "a little more is better."

*Paper presented during 46th midyear meeting, Chemical Specialties Manufacturtrs Assn., Chicago, May 18, 1960.

Insecticidal Concentrations

As with most insecticides, the LD_{50} and LD_{100} of DDVP varies with different insect species and methods of application, e.g., topical, oral or injected. The lethal respiratory dose seems to be somewhat greater than the oral dose. Data in Table 2 show the comparative activity of DDVP vapors and direct contact on the cigarette beetle. Metcalf *et al* (7) found the toxic dose of DDVP vapors for house flies was nearly 3 times greater than the topical dose, 0.057 to 0.02 micrograms.

In our stable tests with DDVP applied on the floor at the rate of 0.5 mg./ft³, it was found that *M. domestica* L., the stable fly and other Dipterae were killed within 2-5 hours, whereas German cockroaches and cigarette beetles were not affected. At doses of 1 mg. DDVP/ft³ the cigarette beetles and flies were killed within 4-5 hours, although 50% of the roaches survived 24 hours exposure. At 2 mg. DDVP/ft³ the three insect species were killed within 18 hours exposure. By direct contact with a 0. 5% emulsion of DDVP bioassays indicated that all three species were killed within 20 hours by 1-2 micrograms of DDVP.

Metcalf (8) attributes the insecticidal activity of DDVP to its anticholinesterase activity and Arthur and Casida (9) suggest that in the ChE blocking process an inert dimethyl phosphoryl enzyme is formed.

Human Exposure to Vapors

It is obvious that, irrespective of the potential insecticidal value of DDVP, its use as an insecticide depends on its toxicity and hazard to sprayers and the occupants of areas treated with the chemical.

Durham (6) established the oral LD_{50} in female rats as 60 mg./Kg., whereas Arthur and Casida (9) showed the intraperitoneal LD_{50} to be 6 mg./Kg. We have observed that the intact conjunctival LD_{50} in rats approximates 10 mg./-Kg. for pure DDVP. Durham (6) also showed that 31 to 118 micrograms DDVP/liter of air was lethal for rats exposed 4.8 to 83.0 hours to DDVP vapors in a respiratory chamber.

On the other hand, Gaines (10) found that the LD_{50} of DDVP in xylene by dermal absorption was greater (75 mg./Kg.) in female rate than their oral LD_{50}. In our cattle tests 9 gms. aqueous DDVP applied daily for 10 days to the intact skin of cows did not lower the cholinesterase levels of their erythrocytes significantly.

Durham (2) in 1956 and Hayes in 1957 (2) followed the cholinesterase changes in erythrocytes and plasma of human volunteers exposed to DDVP in tobacco warehouses. The doses of DDVP ranged from 0.5 mg./ft³ to 10 mg./-ft³. Generally, the results indicated that at doses below 2 mg./ft³ no

Table 2. Effect on cigarette beetles of a DDVP emulsion concentrate diluted in water.

DDVP Concentration	Exposures 24 Hours at 24°C.							
Total Wt.	Vapor				Contact			
Mg.	A*	M	D	% Kill**	A	M	D	% Kill
1.0	0	2	21	100	0	3	20	100
0.5	0	3	22	100	0	2	19	100
0.1	1	4	20	96	0	1	20	100
0.01	4	8	13	84	1	2	17	96
0.00	20	0	0	0	20	0	0	0
1.0% emulsion, no DDVP	18	0	0	0	20	0	0	0

* A indicates Alive; M, Moribund; D. Dead.
** Percent Kill represents the sum of the dead and moribund beetles.

ChE depressions were obtained, whereas at 4 mg./ft³ detectable depressions within the limits of normal variation were observed. At 10 mg./ft³ distinct but small ChE depressions were obtained.

In collaboration with Dr. Clyde F. Smith (11), in 1958, we studied the cholinesterase levels of the erythrocytes and plasma of 18 persons in 6 families who were exposed to the vapors of 0.5 mg./DDVP used for insecticidal purposes in their homes. Periods of daily exposure ranged between 3-18 hours and varied in length from 4 days to 2 weeks, and 3 to about 8 different times during the 4 months of testing. The bleedings for ChE tests were made periodically and each individual was tested twice before exposure to DDVP vapors and 3 to 5 times during exposures.

In no instance was a significant depression observed either in the erythrocytes or plasma of the subject irrespective of the fact that 3 different laboratories tested each sample of the cells and plasma.

The classical behavior of blood cholinesterases of subjects exposed repeatedly to DDVP vapors at insecticidal concentrations is probably shown by the white rat. There is an initial depression, the rate and depth depending directly on the dose of DDVP, followed within a few days or several weeks with a steady rise toward the normal at rate inversely dependent on the concentration of DDVP.

It is significant that insecticidal doses of DDVP in the laboratory or in the field have not shown in humans or animals any physical symptoms of poisoning.

Metabolic Aspects

Since the depression of blood cholinesterase levels in an animal depend on the dose of DDVP rather than on the time of consumption, it is apparent that detoxication occurs at a relatively constant rate below a maximum threshold. When this threshold is reached, the body defences are overwhelmed and the animal is poisoned or dies.

Data in Table 3 show this reaction in cows fed DDVP daily by mouth. In these two milch cows about 1 mg./Kg. caused slight suppression of the erythrocyte ChE, whereas 4.5 mg./Kg. produced severe depression. Nevertheless, as the DDVP dosage changed from 4.5 mk./Kg. to 18 mg./Kg., the depression of ChE in the red blood cells was virtually unchanged. At 27 mg. DDVP/Kg., however, the detoxication threshold was reached and the cow (07) collapsed in cholinergic shock, from which she recovered within 5 hours.

A significant feature of this test was that the 2 calves nursing these cows showed no erythrocyte ChE depression that was abnormal during the entire 70-day test period.

Rat mothers nursing litters were also fed varying doses of DDVP by stomach tube. Doses of 10 and 20 mg. DDVP/Kg. repressed the cholinesterase levels of the erythrocytes nearly 50% without clinical symptoms of poisoning. However, 30 mg./Kg. induced cholinergic shock with recovery in 1-2 hours, causing death of the animal after 12 or more shock doses. In rat mothers fed 40 mg. DDVP/Kg. shock was very severe. Nevertheless, one animal lived to take as many as 23 successive doses before succumbing.

On the other hand, the litters of these animals showed no ChE depression in erythrocytes or plasma although they nursed and lived with their mothers throughout the test periods varying from 18-38 days. In fact, the average individual weights of the litters produced the same rate of growth as control litters with nursing mothers not exposed to DDVP.

The above tests with cows and rats clearly demonstrated that DDVP *per se* is not passed through the mother's milk even when the accrued DDVP exceeded by 2 to 3 times the LD_{50} dose.

Such findings obviously imply that DDVP is readily detoxified in a mammal exposed repeatedly to sublethal oral doses. When rats that were killed with multiple oral doses of DDVP, were dissected and their various organs exposed to *M. domestica* L. under conditions of bioassay, the organs were non-toxic for the flies, excepting for the stomach. The brains of rats killed within 12-16 hours after the last DDVP dose were also significantly toxic for the flies, but not when death occurred within about 20 hours.

When the livers of normal rats were excised and macerated and then mixed with DDVP, *in vitro*, it was found by bioassay with *M. domestica* L. that after 18-20 hours incubation at 37°C. 500 micrograms of DDVP were detoxicated by 1 gram of liver. This quantitive detoxication was equalled by fresh pork, beef, cat and chicken livers. No other tissues in rats, cats or chickens approached this rate of detoxication.

These data clearly indicate that the liver is an important center for detoxication of DDVP in the mammal. Furthermore, it was clear from the tests that DDVP is not

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Table 3. Cholinesterase levels in cows fed DDVP orally.

			COWS	
		Accrued	△pH/Hr.	
Days	Mg./Kg.	DDVP (gms)	07	23
4	0.	0.	.32	.35
7	0.	0.	.48	.45
32	.9	4.4	.30	.35
51	4.5	38.1	.07	.06
61	9.0	83.5	.06	.06
69	18.0	155.5	.05	.09
70	18.0	164.5		.05
70	27.0	169.0	.00	

Evaluation of a

New Floor Polish Ingredient

By Walter J. Hackett and Daniel Schoenholz*, Foster D. Snell, Inc., New York

and Manton G. Bestul and Paul D. Patrick, Jr., West Virginia Pulp and Paper Co. Charleston, S. C.

New modified tall oil fatty acid yields dry bright polishes combining economy with high gloss, superior leveling and wear properties.

USE of tall oil-derived fatty acids in amine soap emulsifier systems for wax dispersions has always been of interest, because of substantial cost savings as compared to oleic acid. Tall oil soaps, however, usually showed some inferiority in performance. In some instances, more tall oil fatty acid than oleic acid is necessary for the preparation of emulsions exhibiting satisfactory bright dry gloss characteristics, thus reducing the cost advantage and contributing to film softness and tack of the finished polish preparation. Additional difficulties were occasionally encountered in removal and leveling properties. The presence of abietic type rosin acids is also objectionable since some floor wax specifications require a negative Lieberman Storch test.

Pilot experiments with a new tall oil derivative, "Indusoil 57-118," recently developed and marketed by the West Virginia Pulp and Paper Company indicated that this fatty acid yielded better soap type emulsifiers and in addition gave a negative test for abietic acid.

The subject matter of this paper concerns a study, undertaken in our laboratories, aimed at determining the comparative emulsification efficiency exhibited by a typical singly distilled oleic acid, the new tall oil fatty acid, a five per cent rosin acid tall oil, and a sample of tall oil fatty acid consisting of a composite of several brands of tall oil fatty acids having a maximum of one per cent rosin acids. For the sake of brevity the former product will be herein referred to as TOFA, 5% and the latter as TOFA, 1%.

Table I gives the chemical properties of these various acids obtained by vapor phase chromatography. The data on the oleic acid was provided by the supplier.

The analyses suggest that the new product has greater similarity to oleic than do the other tall oil acids. Total unsaturation is decreased. C_{18} monounsaturated acids are increased while diunsaturated acids are decreased. Rosin acids, while present, are no longer of the abietic type.

Emulsification Efficiency

It has been our experience that comparative differences in emulsification efficiency are best assessed by determining the proportions of soap emulsifier needed for minimal gloss. Further reduction of the soap content causes an in-

Table I — Chemical Properties of Fatty Acids

	New Modified(1) TOFA	Oleic(2)	TOFA(3) 5% RA	TOFA(4) 1% RA
Analysis				
Acid number	190	200	192	196
Rosin acids, %				
abietic type	0	0	4.5	0.93
modified	4.8	0	—	—
Unsaponifiables, %	1.5	0.6	2.8	2.9
Color (Gardner)	6	4	4	4½
Iodine value	89	89	127	125
Composition, fatty acids (as analyzed by gas chromatography)				
C-14 Myristic	—	5.0	—	—
C-16 Palmitic	11.4	5.0	9.3	1.5
C-18 Stearic	3.6	1.0	3.2	2.1
C-18 Oleic	62.4	79.0	47.5	56.0
C-18 Linoleic	3.6	9.0	34.7	39.1
C-18 Linolenic	—	1.0	2.6	1.4
C-18 to C-24 Monobasic acids	19.0	—	2.7	—

(1) "Indusoil 57-118" — West Virginia Pulp and Paper Co.
(2) Commercial oleic acid, single distilled, 4-6% titre.
(3) "Indusoil L-5" — West Virginia Pulp and Paper Co.
(4) Composite of commercial tall oil fatty acids having less than 1% rosin acids.

*Paper presented at 46th annual meeting, Chemical Specialties Manufacturers Association, Washington, D. C., Dec. 9, 1959.

Table 2A. Composition and gloss of minimum emulsifier content polyethylene dispersions with four test fatty acids

	Morpholine	AMP	Triethanolamine
Part A @ 200-210°F.			
Emulsifiable polyethylene	120	120	120
Fatty acid	8	9	14
Part B at room temperature			
Amine	9	9.5	10
Part C at 200-210°F.			
Water	713	711.5	706
	850	850	850
Performance properties			
	Gloss on black glass		
Fatty acid			
"Indusoil 57-118"	80	89	73
TOFA (5% RA)	68	85	54
Oleic Acid S. D.	78	88	63
TOFA (1% RA)	58	82	54

crease in wax particle size and an attendant decrease in bright dry gloss and stability. A bright drying, stable, translucent emulsion may thus not be obtained at lower amine soap contents. A gloss value of 75-80 on black Carrara glass was considered to be indicative of this critical point.

Our study then concerned a comparison of various wax emulsions prepared at equivalent minimum concentrations of the amine soaps. The representative waxes, carnauba, emulsifiable Fischer-Tropsch and polyethylene were used. Each basic type of wax was emulsified with minimum quantities of each of the acids and the three most commonly used emulsifying amines – morpholine, triethanolamine, and 2-amino, 2-methyl, 1-propanol.

On the basis of several experimental dispersions, a soap content was selected which yielded emulsions of the three wax types exhibiting gloss values close to the critical range. Each series of wax dispersions employing said soap content was prepared with the different fatty acids. Separate series were prepared with each of the emulsifying amines. The comparative emulsions were examined for film translucence and gloss characteristics on black glass.

The minimum emulsifier content wax dispersions and the gloss values so obtained are shown in Tables 2a, b, and c. For ease of referral, the fatty acids are numerically rated for emulsification efficiency, based on bright dry gloss values, in Table 3. Visual ratings as regards translucency and film clarity are also listed.

It is evident that in all but one instance, the dispersions containing the new modified TOFA exhibited higher gloss values and were in all cases judged to have, or be among those products having, the greatest degree of film clarity and translucence. The emulsions containing the composite sample of TOFA 1% and the TOFA 5% product were consistently rated as 3 and 4. It should be pointed out here, that the gloss superiority of the modified TOFA dispersions over the oleic acid counterpart product was sometimes in the order of only one to two units per mil. The emulsification efficiency of the new product was thus, at worst, equivalent to that of oleic acid.

As another and perhaps more basic means of comparing emulsifier effectiveness, the relative particle size of emulsions con-

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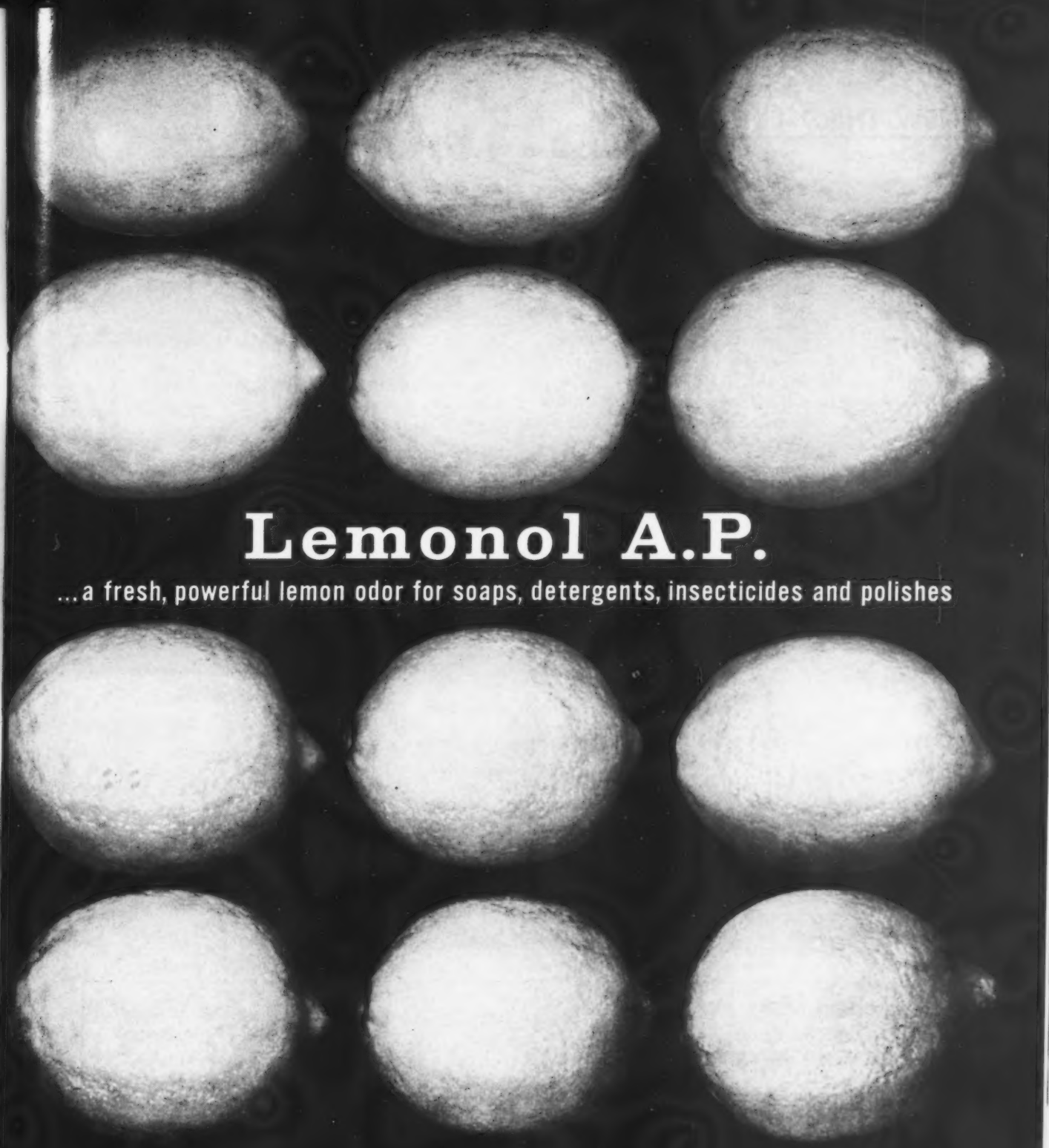
Table 2B. Composition and gloss of minimum emulsifier content "F-T" wax dispersion with four test fatty acids

	Morpholine	AMP	Triethanolamine
Emulsifiable Fischer-Tropsch wax	120	120	120
Fatty acid	10	8	14
Part B @ 200-210°F.			
Borax	4	4	4
Water	10	10	10
Part C at room temperature			
Amine	8.5	8	11.5
Part D at 200-210°F.			
Water	697.5	700	690.5
	850	850	850
Performance properties			
	Gloss on black glass		
Fatty acid			
"Indusoil 57-118"	83	81	85
TOFA (5% RA)	71	78	82
Oleic Acid S. D.	84	82	82
TOFA (1% RA)	55	41	42

Table 2C. Composition and gloss of minimum emulsifier content carnauba dispersions with four test fatty acids

	Morpholine	AMP	Triethanolamine
Part A at 200-210°F.			
Carnauba #33 N. C. Ref.	115	115	115
Fatty acid	12	9	14
Part B at 200-210°F.			
Borax 5 Mol	4	4	4
Water	10	10	10
Part C at room temperature			
Amine	10	8.5	16
Part D at 200-210°F.			
Water	699	703.5	691
	850	850	850
Performance properties			
	Gloss on black glass		
Fatty acid			
"Indusoil 57-118"	86	84	85
TOFA (5% RA)	83	77	73
Oleic Acid S. D.	82	82	85
TOFA (1% RA)	76	65	83



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Putting Ideas to Work

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taining equal amounts of each of the fatty acids was determined. The turbidimetric procedure described by Bolton and Marshall, *Soap and Sanitary Chemicals*, September 1949, was used. In this work only oleic acid, modified TOFA and five per cent rosin acid tall oil was included. The results are shown in Table 4.

Again the new material in each case exhibited behavior equal to or better than single distilled oleic and substantially superior to TOFA 5%.

In order to compare on a more quantitative basis, emulsifying efficiencies of the fatty acids, the gloss deficient emulsion or emulsions within the polyethylene series containing equal amounts of the four acids were reprepared at increased soap contents until gloss values were obtained which approximated those of dispersion containing the modified TOFA.

In general, only 0.3 – 1.0 pound of additional oleic acid per 120 pounds of each wax was required to balance gloss characteristics. However, significant quantitative differences were evident in the corresponding dispersion containing TOFA, 5% RA and TOFA 1% RA, where 4.5–5.5 pounds of additional acid and the required additional amine were needed for gloss balance within the series. Table 5 demonstrates the ratio of the new modified TOFA within one of these series of dispersions.

Performance Properties

Performance properties of polishes containing the four fatty acids were evaluated and compared. Simple self-polishing waxes were prepared by blending series of the different classes of wax dispersions, containing equal high, moderate, and minimum amounts of each amine soap, with an ammoniacut shellac solution in the ratio of 80 parts by volume of wax to 20 parts by volume of shellac solution. The floor waxes thus prepared were evaluated for differences in some polish performance properties we would expect to be affected by

Table 3. Order of comparative emulsification efficiencies of fatty acids (Based on bright dry gloss values)

	Carnauba Systems			Polyethylene Systems			"F—T" Systems		
	Morpho-line	AMP	TEA	Morpho-line	AMP	TEA	Morpho-line	AMP	TEA
Fatty Acid									
"Indusoil 57-118"	1*	1*	1*	1*	1*	1*	2*	1*	1*
Oleic Acid	2	2*	1*	2	2	2	1*	2*	2*
TOFA (5% RA)	3	3	3	3	3	3	3*	3	2*
TOFA (1% RA)	4	4	2	4	4	3	4	4	3

*The dispersion or dispersions marked with asterisks were visually rated as exhibiting the greatest degree of translucency and film clarity.

fatty acid content.

A. Leveling—Official Test Linoleum. Film drawn down — overlapping strokes.
B. Discoloration — White Linoleum.
C. Removability (3).
D. Stability at 125°F. (4).
E. Film Hardness (5).
F. Floor Service Performance (6).

The performance results obtained for several representative wax polish types are comparatively presented in Tables 6 and 7.

Table 5. Proportions of fatty acids needed for equally glossy dispersions.
(Pounds per 100-gallon batch)
General Formula

Part A at 200-220°F.	
Emulsifiable polyethylene	120 lbs.
Fatty acid	As below
Part B at room temperature	
Morpholine	9 lbs.*
Part C at 200-210°F.	
Water	q.s.
	850 lbs.

The following differences and similarities were noted:

a. No significant differences existed as regards discoloration, stability or Sward hardness properties of equivalent polishes containing the different fatty acids.

b. The polishes containing the new modified TOFA exhibited a slight superiority as regards leveling characteristics.

c. Slight difficulties in arriving at complete removal occurred, in polishes containing high proportions of TOFA, 5% and TOFA, 1%.

Floor service tests comparing modified TOFA, oleic acid and TOFA 5% were conducted. The following results were obtained:

a. No adverse effects on floor service performance were noted in the polish containing the new TOFA.

b. Polishes incorporating the new TOFA were judged equal to those formulated with oleic acid.

Table 4. Particle size, microns

	AMP 9.5	F.A. 9	P.E. 120	Morph. 9	F.A. 8	P.E. 120	TEA 16	F.A. 14	Carn. 115
"Indusoil 57-118"		0.086			0.098			0.108	
Oleic Acid		0.090			0.103			0.107	
TOFA 5%		0.120			0.110			0.113	

Faty acid	Pounds per 100 gallons	Gloss of dispersion	Fatty acid to wax ratio	% Efficiency as compared to "standard" oleic acid
"Indusoil 57-118"	8.0	80	1:15.0	100.4
Oleic Acid	8.3	79	1:14.5	100
TOFA, (5% RA)	13.5	80	1:9.8	61.5
TOFA, (1% RA)	12.5	79	1:9.6	66.3

*Amount of morpholine listed above was employed in the 57-118 and oleic acid dispersions. Where a greater fatty acid content was necessary, additional morpholine on the order of 0.31 pounds per pound of fatty acid was employed.

Both exhibit excellent leveling and nondiscoloring properties and approximately equivalent "good" slip resistance and wearability.

c. The polish containing TOFA 5% was, as expected, deficient in soil resistance and, to some extent, in heel mark resistance owing to the higher concentration of film softening fatty acid.

Economics

Potential savings by the use of the new TOFA are evident from the following price quotations, cents per pound, in tank car lots:

	Cents per pound
"Indusoil 57-118"	10
Oleic acid, single-distilled	14
TOFA (5% RA)	7
TOFA (1% RA)	8½

Substantial savings can be effected due to the initial purchasing price of the new product. The emulsification efficiency of "Indusoil 57-118" has been shown to be equal to or superior to that of other fatty acids thus contributing to the maintenance of this savings differential in cases of direct substitution in new or established floor polish compositions.

Table 7. Floor service performance after 4 weeks' traffic — 80/20 polyethylene-shellac self-polishing waxes at equivalent bright-dry-gloss

Dispersion Portion of Polish Contains:	10 Lbs. Oleic Acid	15 Lbs. TOFA (1% RA)	10 Lbs. "Indusoil 57-118"
Gloss (Visual)*			
Initially, before traffic	Excellent	Excellent	Excellent
After 4 weeks' traffic	Good-1	Good-2	Good-1
Leveling	Excellent	Excellent	Excellent
Yellowing of Tiles			
Initially, before traffic	None	None	None
After 4 weeks' traffic	None	None	None
Slip Resistance			
Initially, before traffic	Very good	Very good	Very good
After 4 weeks' traffic	Good-2	Good-1	Good-2
Soil Resistance			
After 4 weeks' traffic	Fair-2	Poor	Fair-1
Rubber Heel Mark Resistance			
After 4 weeks' traffic	Fair-1	Fair-2	Fair-1

*Numbers indicate order of preference where two products are rated equal.

Summary

A new tall oil derived fatty acid, "Indusoil 57-118", has been (*Turn to Page* 174)

Table 6. Performance properties of self-polishing waxes prepared by blending corresponding wax dispersions containing the four fatty acids 80/20 with ammonia-cut shellac

Wax type and dispersion system	Leveling	Discoloration	Removability	Stability at 125°F.	Film Hardness (Sward Rocker Value)
Carnauba-morpholine-high fatty acid content					
Oleic acid	Good	Slight	Complete removal 75 strokes	OK, 30 days	35
TOFA (5% RA)	Fair	Negligible	Complete removal 75 strokes	OK, 30 days	33
"Indusoil 57-118"	Good	Slight	Complete removal 75 strokes	OK, 30 days	34
TOFA (1% RA)	Good	Slight	Complete removal 75 strokes	OK, 30 days	34
Petronauba-TEA-moderate fatty acid content					
Oleic acid	Good	Negligible	Complete removal 75 strokes	Gells, 5 days	38
TOFA (5% RA)	Good	None	Complete removal 75 strokes	Gells, 5 days	37
"Indusoil 57-118"	Excellent	Negligible	Complete removal 75 strokes*	Gells, 14 days	38
TOFA (1% RA)	Good	Negligible	Complete removal 75 strokes*	Gells, 4 days	36
Polyethylene-AMP-minimum fatty acid content					
Oleic acid	Excellent	None	Complete removal 75 strokes	Creams, 1 day	43
TOFA (5% RA)	Good	None	Complete removal 75 strokes*	Creams, 1 day	44
"Indusoil 57-118"	Excellent	None	Complete removal 75 strokes*	Creams, 1 day	45
TOFA (1% RA)	Good	None	Complete removal 75 strokes	Gells, 1 day	45

*Polishes containing TOFA (5% and 1% rosin acids), while rated as completely removed after 75 strokes, did exhibit negligible residues and/or required a greater number of strokes (within the required 75-stroke limit) than did the oleic or "Indusoil 57-118" polishes.

Food Additives and the FDA

By J. Kenneth Kirk*,
Assistant to the Commissioner
Food and Drug Administration
U. S. Department of Health, Education, and Welfare

AFTER enactment in September 1958 of the Food Additives Amendment to the Federal Food, Drug, and Cosmetic Act, there were a number of industries which found themselves having many questions to answer about the application of this new law whereas those industries had heretofore considered that, by and large, they had little, if anything, in common with the Food and Drug Administration.

In some instances, the realization of the possible application of this law was delayed for some months after the passage of the amendment and came to light only when customers began to demand reassurances that the use of certain products would not result in food products adulterated due to the presence of non-permitted food additives. There is no question but that some of the members of the Chemical Specialties Manufacturers Association were in this category although I know that a number of you have had contacts with us over the years in connection with the use in food plants of insecticides, sanitizers, and similar products.

Perhaps the longest such association of this type has been in the field of using sanitizing chemicals in plants where food was being prepared, packed, or held. As technology developed new and improved chemicals, it became quite apparent some years ago that a number of these proposed for use in food plants were quite toxic and presented opportunities for contamination of the food if they were not properly used. While the Food, Drug, and Cosmetic Act did not give us the authority to approve or specifically disapprove any particular usage, many firms engaged in the manufacture and marketing of these preparations discussed with our scientific people the way in which these products were to be used. Where they were being employed on food handling equipment and the directions called for rinsing that equipment with potable water before any food would come in contact with it after the sanitizing operation had been completed, we offered favorable comment in many cases because the investigational work showed that the rinsing operation adequately removed the sanitizing chemical so that there would be no contamination of the food.

In the case of meat food products and poultry products, the appropriate agencies of the Department of Agriculture were in a position to approve or deny approval to sanitizing chemicals. They did give formal approval to the use of a great many of these based on good evidence showing no contamination of the food with toxic substances.

In the sense that these were formal approvals and that the Food and Drug Administration had also expressed formal opinions that certain usages of sanitizing chemicals would be acceptable, one might conclude that these are prior sanctions as far as the Food Additives Amendment is concerned.

This, however, does not follow in that a prior approval for a usage which would not leave any residue obviously could not apply to a usage of the same chemical which would leave a residue to contaminate the food. If there is no residue there is no involvement of the Food Additives Amendment. However, we are not aware of any current usages of sanitizing chemicals in food plants which do not call for adequate rinsing of equipment to prevent contamination of the food being prepared or handled. As long as you have a product in this category, the Food Additives Amendment is not anything for you to worry about.

The question has frequently arisen, not only in this field, but in the matter of using insecticides in food plants, as to what happens if the plant misuses the product in such a way that some particular batch of the product does become contaminated. We do not consider that an accidental contamination of this sort is a matter for consideration under the Food Additives Amendment since, after all, the product, if properly used, would not have been, in words of the law, "reasonably to be expected to result directly or indirectly in its becoming a component ** of any food." This is not to say that we would condone accidental contamination of this sort but rather that we would have to deal with it under adulteration sections of the law other than Section 409, the Food Additives Amendment.

When we come to insecticides used in food plants or warehouses, we have the opportunities for several different conclusions.

(*Turn to Page* 91)

*Presented at the meeting of the Chemical Specialties Manufacturers Association on May 18, 1960, Chicago, Illinois.

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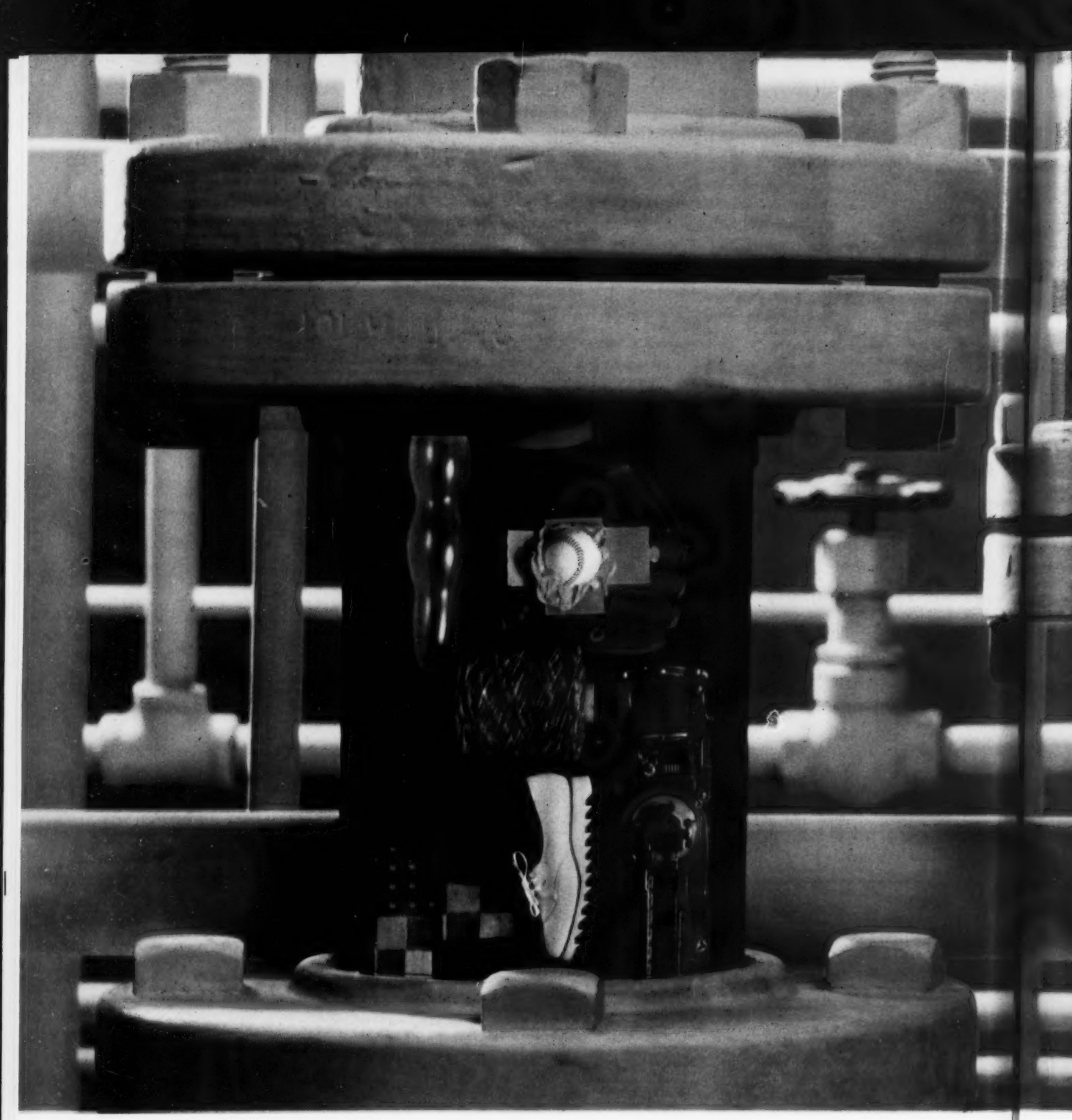

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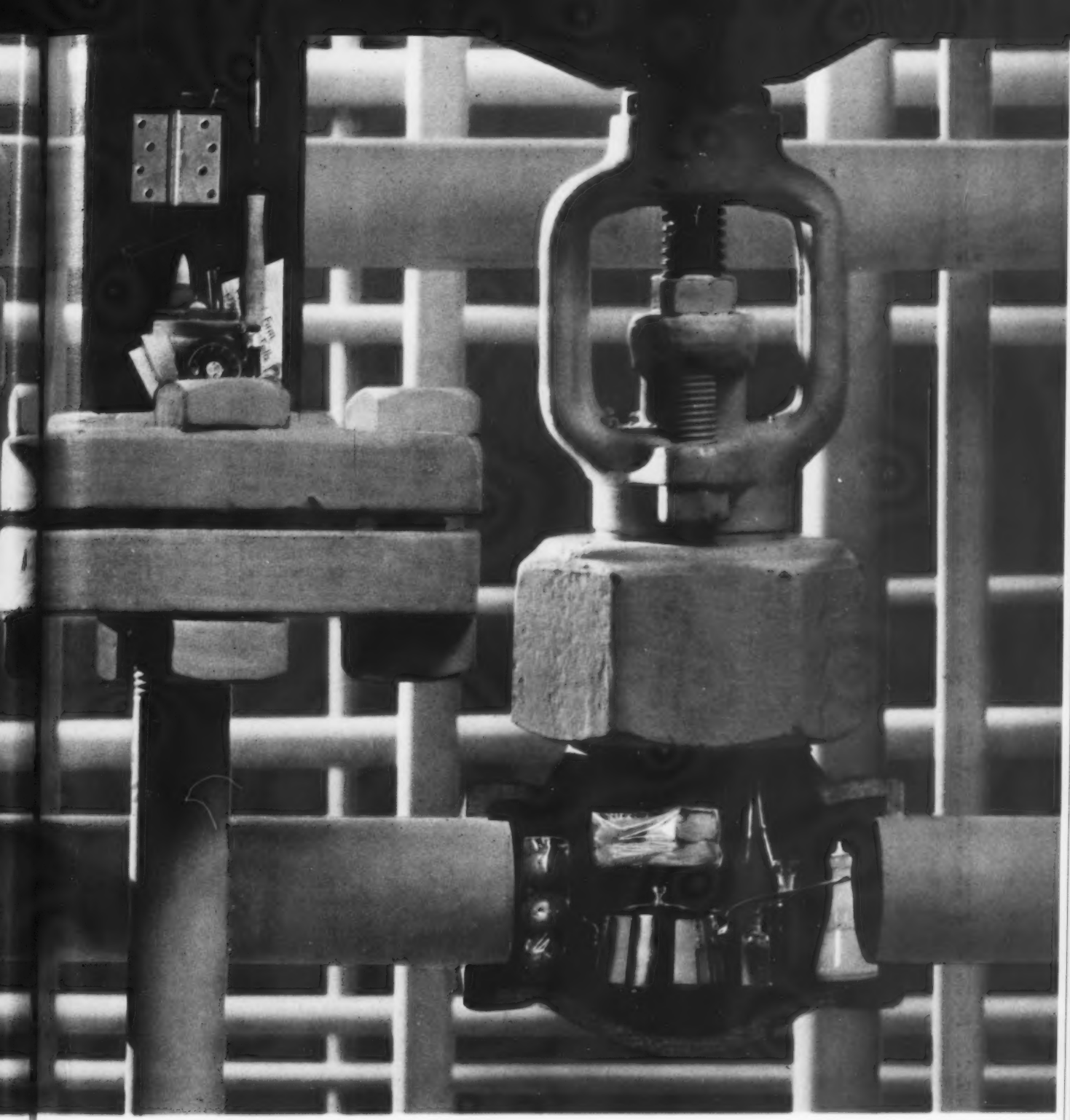

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(*From Page* 85)

There are, of course, many uses of pesticide chemicals in food plants where they are intended to be employed in such a way as to avoid any contamination of the food. An example of this would be the painting of baseboards with a chemical to control roaches or the use of rodenticides in locked bait stations. Then, we have other applications such as those involving fogging where it is possible to keep food supplies in closed containers to prevent contamination with the pesticide and, as in the case of the sanitizing agents, to rinse work surfaces and equipment adequately to prevent contamination before food comes in contact therewith.

There are, however, other uses of insecticides in food plants where it is deliberately intended that the insecticide be added to the food—cases where there would be no point in using the insecticides unless such direct contact could be met. In those cases, unless the pesticide chemical is so volatile that at the conclusion of the processing there would be no residue at all, we have a real food additive situation as far as pesticide residues are concerned, assuming, of course, that the pesticide involved is one which is not generally recognized as safe.

Examples of materials in this category would be the use of hydrogen cyanide for fumigation of some food products and the treatment of flour in a bakery with methyl bromide where it is known that residues will remain in the finished product.

Pursuant to the authority granted in the Food Additives Amendment, the Commissioner of Food and Drugs has already authorized extension of the effective date of the statute as it applies to several uses in this particular field. The extensions so far granted include propylene oxide, pyrethrins, piperonyl butoxide, carbon tetrachloride, ethylene dibromide, ethylene dichloride and pyrethrins resulting as residues from their use as fumigants in foods and food plants. Also on the list were inorganic bromides at a limit of 50 parts per million from methyl bromide fumigation and hydrogen cyanide at a limit of 25 parts per million as a residue resulting from fumigation.

This means that these usages continue to be legal but that prior to March 6, 1961, it will be necessary for formal regulations to be issued authorizing the particular residues in or on food products. The regulations spell out how a petition should be submitted and I do not think I should go into those details here.

On the other hand, it is essential that those who are using these substances based on the extensions of the effective date of the law fully realize that the extensions carry only to next March and that the law does not contain any provision authorizing administrative action to extend its provision beyond that time. Thus, it is encumbent upon those involved to get to us in good season adequate petitions for appropriate regulations so that we will have the time to review and act on them by next March 6th.

In the field of pesticide chemicals, there is, in some quarters, a misunderstanding as to the effect of the tolerances which have been issued under the terms of the Pesticide Chemicals Amendment to the Federal Food, Drug, and Cosmetic Act, commonly known as the Miller Bill.

That law provides for the establishment of safe legal tolerances for pesticide chemicals in or on raw agricultural commodities, in some cases providing for post-harvest application of the pesticide and in other cases making no provision therefor. Under the Food Additives Amendment, a processed food prepared from a raw agricultural commodity bearing a legal residue of such a pesticide chemical will present no food additive problem if, during the processing, the product is handled under good manufacturing practice to result in reducing that residue as much as possible and provided further that the finished processed food when ready to eat does not contain more of the pesticide chemical than is listed in the tolerances for the raw agricultural commodity. This has been misconstrued by some to mean that if, for example, a Pesticide Chemical Amendment tolerance has been set up at, say 5 p.p.m., for Compound X on wheat and would normally result in a residue of, say 3 p.p.m. of the compound in the flour, a miller who is using wheat which has not been

The author, J. Kenneth Kirk, who is Assistant to the Commissioner, Food and Drug Administration, U. S. Dept. of Health, Education and Welfare, as he addressed the general session during the recent meeting of the Chemical Specialties Manufacturers Assn. in Chicago.

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treated with Compound X would be entitled to spray his flour equipment or even the packed flour with Compound X as long as he is sure that the flour does not contain more than 3 p.p.m. of that chemical.

This is not the case. The tolerances established under the Pesticide Chemicals Amendment provide no authority whatsoever for adding those pesticide chemicals to processed foods. Where such addition is contemplated and the chemical, as before, is not generally recognized as safe, there is a need for authority under an appropriate regulation issued in accordance with the provisions of the Food Additives Amendment.

I understand that particularly in your aerosol group, questions have arisen about the use of propellants and can liners especially since, in some areas, you are engaged in packing pressurized food products for others. We have already published in our generally recognized as safe lists—GRAS lists as we call them—a number of propellants which we consider in that category.

Check Propellants

If you have any propellants about which there is any question, I advise you to check with us to see whether or not we regard them as food additives since, if so, they should be covered by appropriate regulations if they are to become part of any food. In this field also, the possibility of migration of unsafe substances from the can liners is a matter of concern to you. Fortunately, the can-manufacturing companies started several years ago to deal with this problem and as you have perhaps noted from the Federal Register announcements, we have given many prior sanctions for certain can-lining materials based on adequate data submitted to us over the years.

There are, however, a large number of can-lining substances for which no prior sanction exists and in those cases we have before us a petition for the establishment of an appropriate regulation to deal with them. A petition has been filed as announced in the Federal Register and is currently under extensive study. This petition, incidentally, presents an interesting situation in that while a great deal of information has been developed on the basis of experimental evidence to show the migration of certain components of can liners to the foods, there is no adequate method of analysis available now whereby we can determine how much of these components are present through examination of a finished food product.

It is therefore contemplated that the method of enforcement will be on the basis of specifications for the can liners themselves, perhaps following along the regulation which we recently issued involving polypropylene wrappers.

In that case too, there was no method for determining the amount of the polypropylene in a food product but we could be sure that if the polypropylene met certain specifications as set forth in the regulation, the amount which might migrate would be safe.

There has been some misunderstanding about prior sanctions and GRAS lists. Prior sanctions which were issued prior to the enactment of the Food Additives Amendment remain valid for the specific uses of the substances covered unless and until these are revoked for cause. There is, however, no way by which a prior sanction can now be revised to take care of some change in the article which has been made since the sanction was granted.

With respect to the GRAS lists, there is no feeling on our part that we have published all of the substances which may be added to food either directly or indirectly and which are in the generally recognized as safe category. Actually, we have advised inquirers of quite a number of other substances which, in our opinion, are to be regarded as generally recognized as safe, and we know that many manufacturers have, on their own initiative, concluded that certain of the substances that they are using are to be so regarded. This is entirely proper.

Meanwhile, of course, as opportunity permits, we expect to publish more items on these so-called GRAS lists and we are entirely willing to accept nominations for the lists where the facts warrant.

Dishwashing Compounds

A side issue to the Food Additives Amendment has come up in connection with questions involving the use of dishwashing compounds and similar substances in hundreds of restaurants and hotels. This was a subject which was considered extensively many years before the Food Additives Amendment was enacted. In recognition of the fact that the direct control of hotel and restaurant operations rests with State and local authorities and since the Public Health Service of the Department of Health, Eduction, and Welfare has had an extensive program of supplying these regulatory agencies with a great deal of information on this field of dishwashing and sanitizing operations in restaurants, we, some years ago, adopted a policy of referring inquiries in this field to the Milk and Food Branch of the Public Health Service.

We see no reason why the Food Additives Amendment should change this situation and unless we encounter some set of circumstances where the public interest clearly calls for some other course on our part, we would prefer to continue to see the control of restaurant and hotel operations remain with State and local officials rather than to try to deal with them under the Federal law.

This comment about public eating places does not apply to colored oleomargarine since we have a clear-cut mandate to enforce the Federal law dealing with the notification of patrons of the serving of that article in public eating establishments.

(Turn to Page 166)

A study of the chemical reactions involved in systems containing trichloromonofluoromethane and ethyl alcohol suggests ways to minimize corrosion due to their activity

Corrosion of Aerosol Cans

By Paul A. Sanders*,
E. I. du Pont de Nemours & Co., Wilmington, Del.

THE storage stability of aerosol products is a problem of paramount importance. Although the large variety of aerosol products now marketed generally have acceptable shelf life, some have shown inconsistencies which have never been satisfactorily explained. Many otherwise successful aerosol formulations have never progressed beyond the laboratory because of the corrosive nature of the products.

In water-based products packaged in metal containers, trichloromonofluoromethane ** is generally considered unsuitable for use since some metals may catalyze the hydrolysis of trichloromonofluoromethane with the liberation of acid (1). As a result, it has been considered advisable to keep the moisture content as low as possible in nonaqueous products formulated with ethyl alcohol and trichloromonofluoromethane in order to minimize hydrolysis. It is now known that the major cause for development of acidity in alcoholic aerosol systems is not hydrolysis of the trichloromonofluoromethane but the reaction of this compound with ethyl alcohol. The mechanism of this reaction is the subject of the present paper.

Historical Background

Previous work in this field on similar reactions suggested strongly that the development of acidity in certain aerosol formulations containing trichloromonofluoromethane and ethyl alcohol resulted from the reaction of the trichloromonofluoromethane with ethyl alcohol rather than from hydrolysis. In 1953, for example, Razuvaev and Sorokin observed that when carbon tetrachloride and ethyl alcohol were heated, a reaction occurred with the formation of ethyl chloride, ethyl ether, paraldehyde, chloroform, and hydrogen chloride (3). Subsequently, Razuvaev and his coworkers found that carbon tetrachloride and isopropyl alcohol reacted in the presence of benzol peroxide as a catalyst with the formation of chloroform, hydrogen chloride, acetone, hexachloroethane, and other products. On the basis of these results, they postulated a free radical mechanism for the reaction (4).

Heberling and McCormack reacted perhalomethanes with ethanolic silver nitrate and found that acetaldehyde, silver halide, and a partially reduced polyhalomethane were formed (5). These workers also reported that a free radical mechanism seemed safely established for the reaction.

Subsequent to the work described in the present report, Witjens reported (6) that a mixture of trichloromonofluoromethane, dichlorodifluoromethane, oxygen, water, ethyl alcohol, and tinplate reacted to form hydrochloric acid, acetaldehyde, and acetal. He explained the reaction on the basis that hydrolysis of the tricholoromonofluoromethane occurred in the presence of the metal or metal halide with the formation of acid. Under the influence of the acid, ethyl alcohol was dehydrogenated to acetaldehyde which in turn was partially converted into the corresponding acetal.

If the reaction between trichloromonofluoromethane and ethyl alcohol were catalyzed by free radicals, as seemed evident from the earlier work, this offered the hope of preventing the reaction by the addition of suitable stabilizers. If the reaction could thus be inhibited, more stable aerosol formulations could be expected. The "Freon" Products Laboratory therefore undertook an investigation of the reaction between trichloromonofluoromethane and ethyl alcohol in order to confirm the free radical nature of the reaction and identify the products that were formed in the reaction.

Conclusions

The reaction between trichloromonofluoromethane and ethyl alcohol is a typical free radical reaction. In the absence of free radical initiators, trichloromonofluoromethane and ethyl alcohol do not react.

In order to study the reaction, it was necessary to accelerate

*Paper presented during 46th midyear meeting, Chemical Specialties Manufacturers Assn., Chicago, May 18, 1960.

**Trichloromonofluoromethane is chemical designation for propellant 11.

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Table I. Composition of Reaction Mixture after 96 Hours at 55° C.

	Mols of reactants initially	Mols of products in reaction mixture
Trichloromonofluoromethane	1.000	0.932
Ethyl alcohol	1.000	0.835
Dichloromonofluoromethane	—	0.071
Hydrogen chloride	—	0.061
Acetaldehyde	—	0.038
Acetal	—	0.033
Ethyl chloride	—	0.004
Water	—	0.025
Tetrachlorodifluoroethane	—	<0.001

the reaction sufficiently so that the reaction products could be quantitatively identified. In the present experiments, benzoyl peroxide was used as the free radical initiator. The reaction was carried out for 96 hours at 55°C in glass. The following compounds were identified as products of the reaction: acetaldehyde, acetal, dichloromonofluoromethane, ethyl chloride, hydrogen chloride, and sym. tetrachlorodifluoroethane. On the basis of these products, the following equations can be written as representing the principal reactions between trichloromonofluoromethane and ethyl alcohol:

$$C_2H_5OH + CCl_3F \rightarrow CH_3CHO + HCl + CHCl_2F \quad (1)$$

$$CH_3CHO + 2C_2H_5OH \rightarrow CH_3CH(OC_2H_5)_2 + H_2O \quad (2)$$

$$C_2H_5OH + HCl \rightarrow C_2H_5Cl + H_2O \quad (3)$$

Equation (1) represents the primary free radical catalyzed reaction between trichloromonofluoromethane and ethyl alcohol. A portion of the acetaldehyde formed in this reaction reacts further with ethyl alcohol in the presence of HCl to form acetal. Ethyl chloride is formed to a minor extent by the reaction between ethyl alcohol and hydrogen chloride. The tetrachlorodifluoroethane is formed by the combination of two dichloromonofluoromethyl radicals.

A quantitative analysis of the reaction mixture by vapor phase gas chromatograph indicated that it had the composition shown in Table I, exclusive of benzoyl peroxide and its decomposition products.

Judging from the composition of the reaction mixture in Table I, acetaldehyde and dichloromonofluoromethane were formed initially in essentially equimolar proportions as would be predicted by equation (1). Under the conditions employed, the reaction occurred to the extent of approximately 7%. Slightly less than half of the acetaldehyde formed initially was converted to acetal.

All of the trichloromonofluoromethane that disappeared during the reaction can be accounted for by the dichloromonofluoromethane and tetrachlorodifluoroethane that were formed. Most of the ethyl alcohol can also be accounted for in the reaction mixture by the products that were formed (1.000 moles of ethyl alcohol initially versus 0.976 moles of ethyl alcohol and derivatives in the reaction mixture). Some of the ethyl alcohol was converted to ethyl benzoate (4) which could not be identified by the gas chromatograph under the conditions employed. Undoubtedly part of the acetaldehyde was converted to condensation polymers. These products could account for the ethyl alcohol that disappeared and was not found.

Water would be formed by reactions (2) and (3). The concentration of water listed in Table I was not determined by analysis. Since the total moles of all the other products in the reaction mixture did not quite equal the number of moles of the starting materials, the difference was assumed to be water. This is the figure in Table I.

Nature of Reaction

The free radical nature of the reaction between trichloromonofluoromethane and ethyl alcohol is confirmed by the following points:

1. Acceleration of the reaction by benzoyl peroxide. According to Ref. 7, "acceleration by typical radical sources (peroxides, etc.) is reliably taken as evidence for a radical chain process." The chain length (moles of acetaldehyde or dichloromonofluoromethane formed per mol of benzoyl peroxide) was 17.5, assuming that all of the benzoyl peroxide decomposed during the reaction. Actually, the chain length was longer since undecomposed peroxide was recovered from the reaction mixture.
2. The same products were formed regardless of the type of free radical initiator employed. Benzoyl peroxide and α α' azobisisobutyronitrile were used as the free radical sources.
3. The reaction is inhibited by high concentrations of oxygen. This is a well known effect of oxygen in free radical reactions. Oxygen is a diradical and can initiate free radical reactions; in larger amounts it may inhibit chain processes by forming relatively unreactive peroxy radicals (Ref. 8).
4. The formation of tetrachlorodifluoroethane. The only plausible explanation for the formation of this compound is by the dimerization of two $\cdot CCl_2F$ radicals. Such radicals could arise only in a free radical reaction.

Free Radical Mechanism

Razuvaev proposed a free radical mechanism to explain the reaction between carbon tetrachloride and isopropyl alcohol. Applying this mechanism to the reaction between trichloromonofluoromethane and ethyl alcohol gives the following results, with the free radical initiator indicated as R.:

Beginning of Chain

$$R\cdot + CH_3CH_2OH \longrightarrow RH + CH_3\dot{C}HOH \quad (4)$$

$$R\cdot + CCl_3F \longrightarrow RCl + \cdot CCl_2F \quad (5)$$

Evidence for the occurrence of reaction (4) was obtained by

reacting benzoyl peroxide with ethyl alcohol alone in glass at 55°C for 96 hours. The acetaldehyde formed in the reaction was identified by means of the 2,4 dinitrophenylhydrazone derivative. Benzoyl peroxide has been shown to react with methyl alcohol to give formaldehyde (2). The formation of aldehydes from alcohols in the presence of benzoyl peroxide has been shown to occur by a free radical mechanism (9).

On the basis of the yield of crude 2,4 dinitrophenylhydrazone derivative obtained, it was estimated that approximately 0.6 mole of acetaldehyde was formed per mole of benzoyl peroxide.

No evidence for the occurrence of reaction (5) was obtained, although previous work had shown that benzoyl peroxide reacts with carbon tetrachloride to give hexachloroethane (10). In the present case, trichloromonofluoromethane was treated with benzoyl peroxide for 96 hours at 55°C in glass. The expected product would be tetrachlorodifluoroethane. No evidence for the presence of tetrachlorodifluoroethane in the reaction mixture was obtained by gas chromatographic analysis. Under the particular analytical conditions that were used, 0.05% of tetrachlorodifluoroethane in the mixture could have been detected.

The data indicate that reaction (4) occurs much more readily than reaction (5). The fact that reaction (5) occurs with carbon tetrachloride and apparently does not with trichloromonofluoromethane would be expected from the stabilizing effect of the fluorine atom in trichloromonofluoromethane.

Once acetaldehyde is formed, a secondary chain process could result as follows (Ref. 11):

$$R\cdot + CH_3CHO \longrightarrow RH + CH_3\dot{C}=O \qquad (9)$$

$$CH_3C=O + CCl_3F \longrightarrow CH_3C(=O)Cl + \cdot CCl_2F \qquad (10)$$

$$CH_3CHO + \cdot CCl_2F \longrightarrow CHCl_2F + CH_3\dot{C}=O \qquad (11)$$

The fact that essentially equimolar concentrations of acetaldehyde (and derivatives) and dichloromonofluoromethane were found in the reaction mixture suggests that reactions (6) to (8) are the dominating chain reactions rather than reactions (9) to (11).

Chain Termination

$$2\ \cdot CCl_2F \longrightarrow CCl_2FCCl_2F \qquad (12)$$

$$2\ CH_3\dot{C}HOH \longrightarrow CH_3CHO + C_2H_5OH \qquad (13)$$

The presence of tetrachlorodifluoroethane in the reaction mixture is evidence for the occurrence of reaction (12).

Free Radical Reaction

A. *General Discussion*: The present reactions were carried out in glass in order to avoid side reactions that might result if metals were present. However, in a few experiments carried out in tinplate containers, acetaldehyde, acid and dichloromonofluoromethane were identified as the reaction products, thus confirming that the mechanism postulated on the basis of the reaction in glass also applied to aerosol formulations packaged in metal containers.

Free radical initiators could be present in aerosol formulations from many sources. The active ingredients used for aerosol formulations seldom are pure compounds. They could contain traces of peroxides, metallic salts, and many other known free radical catalysts.

Solvents could also be a source of free radicals. Alcohols, for example, may be oxidized by air and form aldehydes. Aldehydes are known to form peroxides (12). Many other compounds, such as ethers, unsaturated hydrocarbons, etc. are also known to form peroxides.

B. *Effect of Oxygen*: In low concentrations, oxygen initiates the free radical reaction between ethyl alcohol and trichloromonofluoromethane; in higher concentrations, oxygen inhibits the reaction. This effect of oxygen undoubtedly accounts for many of the inconsistencies that have been encountered in corrosion studies. Actually, this effect is a known property of oxygen. Oxygen is a diradical and can initiate free radical reactions. In lar-

Chains

After the initiation reactions (4) and (5), the following chain reactions occur:

$$CH_3\dot{C}HOH + CCl_3F \longrightarrow CH_3C(Cl)(OH) + \cdot CCl_2F \qquad (6)$$

$$CH_3C(Cl)(OH) \longrightarrow CH_3CHO + HCl \qquad (7)$$

$$\cdot CCl_2F + CH_3CH_2OH \longrightarrow CHCl_2F + CH_3\dot{C}HOH \qquad (8)$$

ger concentrations it may form unreactive peroxides and thus interrupt a chain reaction.

The dual role of oxygen as both an initiator and an inhibitor of the reaction was demonstrated experimentally as follows: mixtures of trichloromonofluoromethane and purified ethyl alcohol were sealed in glass tubes in the absence of oxygen and stored at 100°C. After 21 months, there was no evidence of reaction. This indicates that the reaction does not take place in the absence of oxygen.

Another series of samples with varying amounts of air in the vapor phase was stored in glass bottles at room temperature. Aliquots were removed at various time intervals and analyzed for acidity with the following results:

Volume % air in the vapor phase	Time to development of acidity
0.12	1 Day
0.37	4 Days
1.42	19 Days
23.50	None in 26 Days
48.90	None in 26 Days

The above results correspond roughly to those obtained with samples in tinplate containers. Mixtures of trichloromonofluoromethane and ethyl alcohol with approximately 1% air in the vapor phase developed considerable acidity after two months at 37.7°C. Samples with approximately 20% air in the vapor phase did not develop acidity until stored for 6 months to 1 year at 37.7°C.

C. *Inhibition of the Reaction:* Although air in sufficient concentration in the vapor phase has a retarding effect upon the reaction between ethyl alcohol and trichloromonofluoromethane, the use of air as an inhibitor in aerosol formulations would not be satisfactory for the following reasons:

1. The air content of aerosols is difficult to control with any accuracy, since variables such as rate of loading, temperature of concentrates and propellents, and ambient temperature all affect the amount of entrapped air.
2. Air has an undesirable effect upon the pressure of aerosol products and upon the stability of some components, such as perfumes.
3. It is difficult to establish, even with mixtures of ethyl alcohol and trichloromonofluoromethane alone, exactly what minimum concentration of air is necessary to provide satisfactory storage stability. With aerosol formulations containing active ingredients, the problem becomes considerably more complex because some active ingredients have an inhibiting effect upon the reaction while others accelerate the reaction. Therefore, the level of air required to provide satisfactory inhibition would vary with each particular product. With some products, air would not be a satisfactory inhibitor at any concentration.

In order to avoid the difficulties surrounding the use of air as an inhibitor, an extensive investigation of potential inhibitors for the reaction was carried out. Literally hundreds of candidate stabilizers were screened during the work. Several very effective inhibitors have been uncovered that are suitable for aerosol formulations. Studies with actual aerosol formulations, such as hair lacquers, have demonstrated beyond doubt the effectiveness of the stabilizers. The use of stabilized trichloromonofluoromethane in aerosol formulations containing alcohols should provide considerably improved protection against corrosion.

Experimental

A. Reactions in the Presence of Added Free Radical Initiators

1. Reaction of Trichloromonofluoromethane with Ethyl Alcohol

a. With Benzoyl Peroxide

184 g. (4 mols) of absolute undenatured ethyl alcohol, 550 g. (4 mols) of trichloromonofluoromethane, and 4g. (0.016 mols) of benzoyl peroxide were placed in a 2 liter round bottom flask equipped with an 8" length of 10 mm. glass tubing. The reaction mixture was purged with a slow stream of dry nitrogen while the flask was cooled in a dry ice bath. The flask was then evacuated and sealed. After heating for 96 hours at 55°C, the reaction mixture was cooled and analyzed as follows:

(1) *Qualitative analysis:* Acetaldehyde was identified in the reaction mixture by preparation of the 2,4 dinitrophenylhydrazone derivative. After one recrystallization from dilute alcohol, the derivative melted at 145-147°C (uncorr.). A mixed melting point with an authentic sample of the 2,4 dinitrophenylhydrazone derivative showed no depression.

Acetaldehyde, ethyl alcohol, acetal, ethyl chloride, dichloromonofluoromethane, tetrachlorodifluoroethane, and trichloromonofluoromethane were identified by gas chromtagraphic analysis, using a Perkin-Elmer Vapor Fractometer, Model 154, equipped with a Perkin-Elmer Column B. Approximate concentrations of the components in the mixture were estimated by comparison with controls of known concentration.

(2) *Quantitative analysis*: Acetaldehyde, once formed in the reaction mixture, could be converted to acetal and paraldehyde. Preliminary experiments showed that all three compounds gave essentially quantitative yields of the 2,4 dinitrophenylhydrazone derivative of acetaldehyde. Therefore, the total concentration of acetaldehyde initially formed could be estimated by the yield of the 2,4 dinitrophenylhydrazone dervative. On the basis of a 95% yield of the crude derivative, the extent of reaction (1) was estimated at 6.1%.

Titration of the reaction with 0.1 N NaOH to determine total acidity also indicated that reaction (1) occurred to the extent of 6.1%. This did not account for any acid that had disappeared by conversion to ethyl chloride.

By assuming that the initial reaction (1) occurred to the extent of 6.1%, and knowing the approximate concentration of acetal, acetaldehyde, dichloromonofluoromethane, ethyl alcohol, ethyl chloride, and trichloromonofluoromethane in the reaction mixture from the preliminary gas chromatographic analysis, it was possible to prepare a synthetic mixture with these components having the approximate composition of the re-

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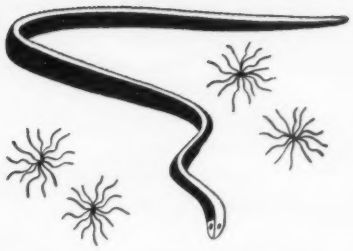

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PHYSICAL PROPERTIES	TS-254	TX-1	ES-254	TS-254A	TS-254AA	TS-970
Melting point °C	63	160	37	50	93	74
Volume Expansion on melting—%	7.7	—	8.9	9.2	9.2	9.1
Penetration, ms/100 gm. load (ASTM D5-25)	0.2	—	1.3	0.3	0.4	0.1
Acid No. (approx.)	7	12	9	2	1-2	6
Solubility, % by wt. in:						
Butanol	7	49	50	22	13	4
Toluene	16	52	49	16	7	16
Carbon Tetrachloride	16	47	49	gel	14	gel
Stoddard Solvent	12	52	49	17	4	5
Butyl Acetate	11	55	49	13	9	6
Methyl Isobutyl Ketone	10	ins.	49	10	8	5
Turpentine	21	10	24	21	10	10

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action mixture. Using this synthetic mixture with an accurately known composition as a new standard, the actual reaction mixture was again analyzed by gas chromatography and the composition was calculated. Taking the average of duplicate runs versus the standard, the composition of the reaction mixture was calculated as previously shown in Table I. The decomposition products of benzoyl peroxide were not determined and were not included in the calculation. They would constitute approximately 0.5% of the reaction mixture.

Distillation of Mixture

Under conditions of the gas chromatographic analysis, i.e., 53° C and 100 mm pressure, it was possible that only a portion of the components in the reaction mixture were being vaporized and identified. In order to prove that the components identified by the gas chromatograph constituted the major portion of the reaction, the mixture was fractionally distilled through a 4' x 1" column packed with helices and equipped with a magnetic still head.

According to the composition of the reaction mixture as determined by gas chromatographic analysis, the lower boiling fraction containing acetaldehyde, ethyl chloride, dichloromonofluoromethane, and trichloromonofluoromethane should comprise approximately 75% of the reaction mixture and the rest of the components approximately 25%. The results of the distillation were:

Lower boiling fraction (trichloromonofluoromethane, etc.)	72.0%
Residue in column and still head	1.9%
Higher boiling fraction (ethyl alcohol, etc.)	25.1%
Loss	1.0%

The results of the distillation therefore essentially confirm the composition of the reaction mixture determined by gas chromatographic analysis.

b. *Reaction with a, a' Azobisisobutyronitrile*

Reactions were also carried out with *a, a'* azobisisobutyronitrile as the free radical initiator in place of benzoyl peroxide. Gas chromatographic analysis of the reaction mixture indicated that the same products were present as in the reaction mixture resulting with benzoyl peroxide. The reaction mixture was not analyzed further.

B. *Reactions of Trichloromonofluoromethane and Ethyl Alcohol in the Absence of Added Free Radical Catalysts*

1. *In the absence of air:* Mixtures of trichloromonofluoromethane in absolute ethyl alcohol (0.1245 molar with respect to the trichloromonofluoromethane) were placed in Pyrex glass tubes, cooled in liquid nitrogen, and evacuated. The frozen mixtures were allowed to thaw, refrozen in liquid nitrogen and again evacuated. The procedure was repeated for a total of three times. The Pyrex glass tubes were then sealed and stored at 100°C. Samples were analyzed at intervals during 21 months for the formation of chloride and fluoride ion. No increase in concentration of chloride or fluoride ion during the storage period was found.

2. *In the presence of varying amounts of air:* 1400 g. (10.1 mols) of trichloromonofluoromethane and 600 g. (13.0 mols) of absolute ethyl alcohol were placed in one gallon bottles equipped with Hoke valves and stored at room temperature. Varying concentrations of air in the vapor phase were obtained by adding different quantities of trichloromonofluoromethane in excess of that desired and boiling off the excess until the correct weight was obtained. The vapor phase of the samples was analyzed for concentration of air by the gas chromatograph. Aliquots from the bottles were examined at intervals for development of acidity.

Summary

Trichloromonofluoromethane and ethyl alcohol were found to react in the presence of benzoyl peroxide with the formation of acetaldehyde, acetal, hydrogen chloride, ethyl chloride, dichloro-

(Turn to Page 175)

It All Began With

(From Page 60)

Inc., and president of Chemactants, Inc. A native New Yorker, Mr. Conrad was graduated from Brooklyn College with a B.S. degree in 1933 and pursued graduate studies at City College, New York. Originally he had intended to study medicine. But the depression precluded that possibility. So he did what seemed the next best thing and devoted himself to pharmacological research at one of the major New York hospitals.

In the late 'Thirties, Lester Conrad and a friend and colleague decided that a commercially practical process for the production of cholesterol from wool grease would be a profitable and worthwhile thing. Cholesterol was scarce in those days and commanded a high price. This is when American Cholesterol Products, Inc., was conceived. However, at the time the two inventors came up with the right answer and had made it workable, the bottom dropped out of the cholesterol market. The young enterprise faced a hard struggle to survive.

Mr. Conrad stresses the point that his firm pioneered acetylated lanolin for cosmetics. When asked for his original motive for orienting his efforts in this direction, he replied that a small enterprise's best chance of success rests in highly specialized products combined with excellent service. He does not believe in competing with larger companies for the lanolin and bulk derivatives market.

American Cholesterol may not be a giant. But a walk through the plant with Mr. Conrad reveals him as an executive of stature. The mixture of respect, confidence and familiarity displayed toward him by all employees, is enjoyed only by a "boss" who knows all there is to know about all phases of the operation and who combines fairness with the knack of handling people.■

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As The Reader Sees It

(*From Page 43*)

sentatives in Los Angeles and the Grocery Manufacturers of America.

In view of this information, we do not feel that "couponing was geared to the grocery store of 50 years ago" but rather believe strongly that it will continue to be an effective promotion device and, even more importantly, a means by which the homemaker can realize substantial savings in her weekly budget.

If you should have any questions on this, we will, as always, be pleased to do our best to answer them.

J. E. Burke, Supervisor,
Product Public Relations,
Public Relations Department,
Procter & Gamble Co.,
Cincinnati, O.

For further comment on the question of couponing see our editorial on page 39. Ed.

Properties of DDVP

(*From Page 76*)

stored in animal tissues nor that toxic metabolites are produced from DDVP.

In view of these findings it is apparent that the hazard of DDVP is related to the amount of acute intake rather than to accumulation in body tissues from repeated exposures or to metabolic deviation of the DDVP molecule in the animal body.

References

(1) Mattson, A. M., J. T. Spillane and G. W. Pearce. 1954. 126th Meeting A.C.S., New York. Sept. 12-17.

(2) Durham, W. F., Hayes, W. J., and Mattson, A. M. 1959. *AMA Archives of Industrial Health* 20: 202-210.

(3) Tracy, R. L., Gentile, J. and Wenneis, J. M. 1957. *Tobacco Science* 1: 143-149.

(4) Tenhet, J. N., E. O. Bare, D. P. Childs and W. F. Durham. 1957. U. S. Dept. of Agriculture AMA-214.

(5) Dierberger, J. E. 1960. Sao Paulo. Personal communication.

(6) Durham, W. F., T. B. Gaines, R. H. McCauley, V. A. Sedlak, A. M. Mattson and W. J. Hayes. 1957. *AMA Archives of Industrial Health* 15: 340-349.

(7) Metcalf, R. L., T. R. Fukuto, R. B. March. 1959. *Jour. Econ. Ento.* 52: 44-49.

(8) Metcalf, R. L. 1959. *Bull. Ento. Soc. Am.* 5: 3-15.

(9) Arthur, B. W. and Casida, J. E. 1957. *J. Agri. Food Chem.* 5: 186-92.

(10) Gaines, T. B. 1960. *Tox. & Appl. Pharm.* 2: 88-99.

(11) Smith, C. F. 1958. Unpublished report.

New Developments

(*From Page 50*)

covering it did not issue until 1949 (14). Their development was partly responsible for the tremendous growth of the dodecyl benzene sulphonate-based heavy-duty household detergents.

Polypropylene also found application in the non-ionics. Octyl phenols made by reacting phenol with di-isobutylene in the presence of sulphuric acid had been known and used as bases for non-ionics since the 1930's (7) but tripropylene provided a convenient new olefin with which to produce nonyl phenol. The polyoxyethylene derivatives of nonyl phenol, not only share the spotlight with their octyl phenol counterparts today but have even outrun them. The increased production of non-ionics during recent years is due in part to the two discoveries cited above, the introduction of tripropylene and the discovery of the block polymers.

The sulphates of alkyl phenol ethoxylates have come into prominence during recent years because of their mildness on the skin, in which respect they surpass even the fatty alcohol sulphates, and because of their stable foam. Surface active agents of this chemical composition are not new but were disclosed in several early patents (15). Today they are made by reacting octyl or nonyl phenol with ethylene oxide, to give short polyoxyethylene chains, followed by sulfation. A more recent patent (16) discloses further improvements. The sulphated alkyl phenol ethoxylates are marketed under the trade name of "Alipals." Analogous compounds based upon lauryl alcohol are sold under the name of "Sipon ES."

The use of alkylolamides of the fatty acids has expanded greatly during recent years because of the ability of these compounds to stabilize foam. The great increase in the use of dodecyl benzene sulphonates as active ingredients in the heavy-duty household detergents has made the use of foam stabilizers necessary because the foam produced by these compounds is unstable in the presence of grease. Alkyolamides made in accordance with the process disclosed in the original Kritchevsky patent (8), consist of complex mixtures (17) which, although good surfactants, leave something to be desired when used as foam stabilizers. By starting with the methyl esters of the fatty acids it is possible to produce high activity materials containing as much as 95% alkylolamide. Isopropanol amides, which are solids, are also on the market and seem to be preferred in the solid cleaners. A development announced only very recently (18) is concerned with an improved alkyl benzene containing a longer alkyl chain. It is stated that the detergency and foaming characteristics of the sulphonate made from this alkane are such as to minimize the need for expensive foam boosters. Indeed, laboratory tests indicate that products based on the new alkylate with no foam stabilizers perform as well as dodecyl benzene sulphonate with foam boosters added.

Another significant new raw material was placed at the disposal of the surfactant industry in the long chain alcohols from the oxo process (19), especially tridecyl alcohol. Basically, the oxo re-

Basic Oxo Reactions

$$RCH{=}CH_2 + CO + H_2 \rightarrow RCH_2CH_2CHO$$

$$RCH_2CH_2CHO + H_2 \rightarrow RCH_2CH_2CH_2OH$$

The Shell chemicals listed below are sources for many important commercial products.

Familiar landscape?

The inquiring chemist explores many interesting product "landscapes" in his work. This photomicrograph shows crystals of *tertiary butyl alcohol* at 65°F. TBA, a Shell chemical with intriguing features, finds its way into a variety of industries.

Shell manufactures more than thirty industrial chemicals—among them *allyl alcohol* and *allyl chloride*. Because of the di-functional nature of these two products, they are used as intermediates in the synthesis of many important chemicals. Derivatives of allyl alcohol are widely used in drugs and cosmetics. Allyl chloride is an intermediate in the synthesis of resins for thermosetting plastics, varnishes, and adhesives.

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Methyl Isobutyl Ketone
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action consists in catalytically combining carbon monoxide and hydrogen with an olefin at elevated temperatures and pressures. The reaction product is an aldehyde with one more carbon atom than the olefin feed stock. Reduction of the aldehyde produces a primary alcohol. Excellent surfactants are produced either by sulphating tridecyl alcohol or by reacting it with ethylene oxide to produce a non-ionic type compound.

A new class of amphoteric compounds, made by reacting long chain fatty amines with methacrylate (20), have recently come on the market. These compounds, which are sold under the name of "Deriphats," do not seem to have been fully enough explored to find their best fields of application. However, there is growing interest in the amphoterics. Imidazoline derivatives (21) which have been on the market for some years not only show good compatibility and foam stability but, due to very low eye irritation, have been found useful in shampoos.

Fluorine-containing surfactants have been recently developed (22), especially aliphatic carboxylic acids in which hydrogen atoms have been replaced by fluorine. Up to the present time, compounds of this class are far too expensive for the conventional surfactant uses, but their properties are so unusual that they will certainly find important special applications.

A unique new class of nonionic surface active agents has recently come into commerce under the trade name of "Surfynols" (23). These compounds, which consist of tertiary acetylenic glycols, are an outgrowth of the researches on acetylene chemistry conducted by Dr. Walter Reppe in Germany over the fifteen year period prior to the end of World War II and often referred to as "Reppe" chemistry.

On a theoretical basis, one would scarcely have expected acetylenic glycols of the structure in question to possess surface active properties. Nevertheless, they do display good wetting action, not only in water, but in acid and alkaline solution. They also exhibit pronounced synergistic action in the presence of alkali and, according to the makers, produce less foam than any other class of surfactants, a valuable property in certain applications. Up to the present time these compounds are too high in price for many of the conventional uses of surfactants, but they will certainly find specialized applications, either alone or in combination with other surfactants.

In a paper presented before the New York Academy of Sciences in 1945, the writer pointed out the need for more research on correlation between the chemical composition of surface active agents and their performance as wetting agents, dispersants, emulsifiers, detergents and so forth. The amount of work published since that time is distinctly disappointing.

However, if I may venture a prediction for the future, the trend will be in this direction. If surface active agents are to enjoy the healthy industrial growth that they merit, manufacturers must make the necessary effort to learn more about the influence of the chemical constitution of their products upon their behavior under a great variety of conditions.

In the earlier period when new surfactants appeared on the market almost daily and it was easy to interest customers in the miraculous new "wetting agents," it was too much trouble to study how chemical compositions influenced the surface active behavior of the product in the presence of hard water, acid, alkali, salts, electric current and a host of other conditions. Today, manufacturers are being forced to study in detail the practical conditions to be met with in the field, and in many cases to tailor make a molecule to meet the user's needs.

This is just another way of saying that intensive evaluation of known chemical types of surface active agents, rather than the discovery of new chemical types, will be the future trend in this field.■

Bibliography

1. German Patent 330,558. (May 4, 1921), F. Günther, (to Badische Anilin und Sodafabrik.
2. U. S. Patent 1,968,797 (July 31, 1934), H. Bertsch.
3. U. S. Patent 1,881,172 (Oct. 4, 1932), K. Daimler and K. Platz (to I. G. Farben.)
   U. S. Patent 1,932,180 (Oct. 24, 1933), F. Günther, F. Münz and H. Haussmann (to I. G. Farben).
4. U. S. Patents 2,088,014-2,088,021 (July 27, 1937), J. N. Wickert et. al. (to Union Carbide Corp.)
5. U. S. Patent 2,028,091 (Jan. 14, 1936), A. O. Jaeger, (to Amer. Cyanamid Co.)
6. U. S. Patent 1,970,578 (Aug. 21, 1934), C. Schoeller and M. Wittwer (to I. G. Farben).
7. U. S. Patent 1,987,228 (Jan. 8, 1935), H. A. Bruson (to Resinous Products).
   U. S. Patent 2,008,017 (July 16, 1935), W. F. Hester (to Rohm & Haas).
   U. S. Pat. 2,008,032 (July 16, 1935), J. B. Niederl (to Rohm & Haas.)
8. U. S. Patent 2,089,212 (Aug. 10, 1937), Wolf Kritchevsky.
9. U. S. Patent 1,737,458 (Nov. 26, 1929), M. Hartmann and J. Kagi (to Ciba).
10. Domagk, G, *Deut. med. Wochschr.*, 61,829-32 (1935).
11. Macon, Ralphp, *Soap & Chem. Specialties*, 35, No. 6, 47-50, 109 (June 1959).
12. U. S. Patent 2,674,619 (April 6, 1954), L. G. Lundsted (to Wyandotte Chemicals Corp.)
    U. S. Patent 2,677,700 (May 4, 1954) D. R. Jackson and L. G. Lundsted (to Wyandotte Chemicals Corp.)
13. Vaughn, T. H., Jackson, D. R. and Lundsted, L. G. *J. Amer. Oil Chemists' Soc.*, 29,240-43 (1952).
14. U. S. Patents 2,477,382-3 (July 26, 1949), A. H. Lewis (to California Research Corp.).
15. U. S. Patent 2,083,482 (June 8, 1937) A. Steindorff et. al. (to I. G. Farben).
16. U. S. Patent 2,758,977 (Aug. 14, 1956), C. M. Knowles and J. J. Ayo to Gen. Aniline & Film Corp.).
17. Kroll, H. and Nadeau, H., *J. Amer. Oil Chemists Soc.*, 34, 323-326 (1957).
18. Oronite's New Detergent Alkylate, *Soap & Chem. Specialties*, 36, No. 4, 52-53; 184-85 (April 1960)
19. L. F. Hatch, Higher Oxo Alcohols, John Wiley & Sons, Inc., New York, 1957.
20. U. S. Patent 2,810,752 (Oct. 22, 1957), R. G. Freese (to General Mills, Inc.) U. S. Patent 2,816,911.
21. U. S. Patent 2,528,378 (Oct. 31, 1950), Hans S. Mannheimer (to J. J. McCabe and H. S. Mannheimer).
22. Schwartz, A. M., Perry, J. W. and Berch, J., *Surface Active Agents and Detergents*, Vol. II. Interscience Publishers, Inc. 1958, p.p. 150-153.
23. Air Reduction Company New Product Data Bulletin S-1.

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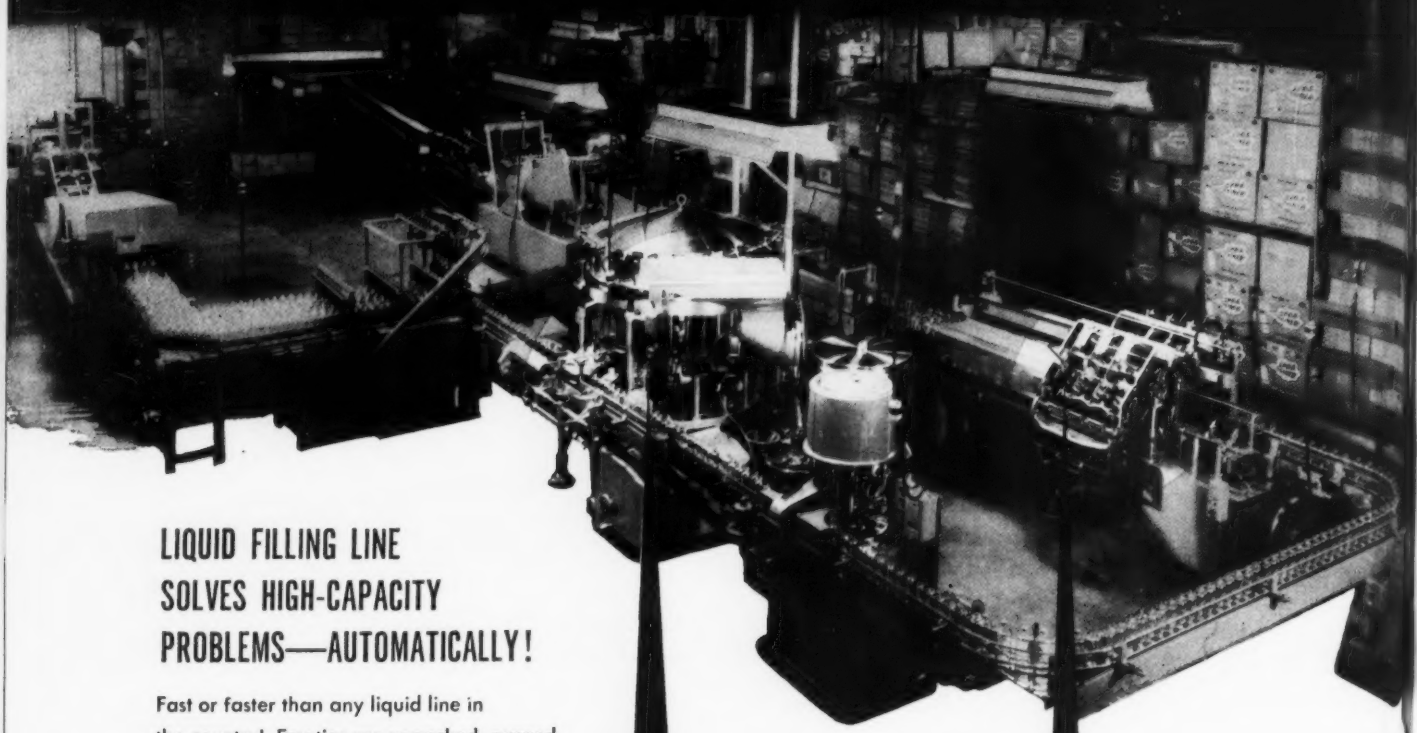

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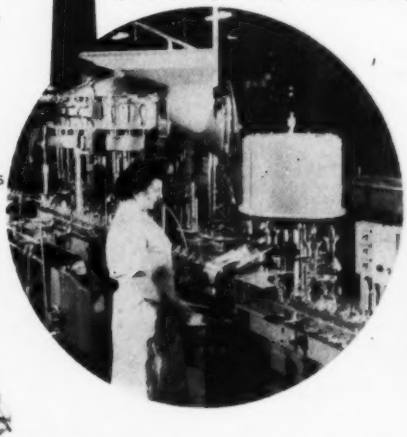

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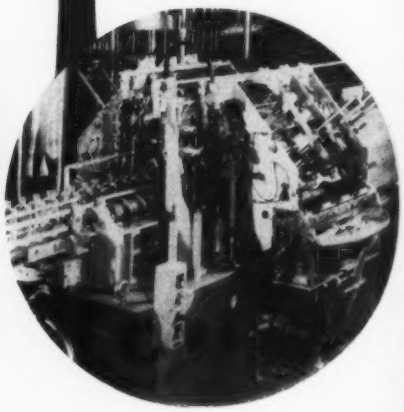

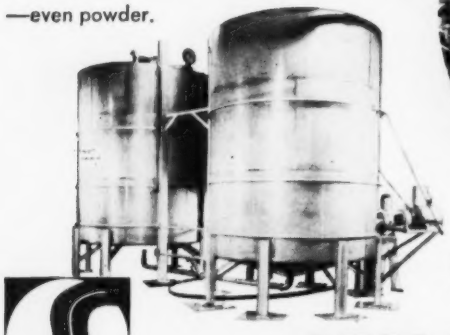

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Modern Trends in

Packaging Automotive Specialties

By Bruce H. Morgan*
Continental Can Co.
Chicago, Ill.

TRENDS are defined in the dictionary as "having or taking a particular direction, prevailing tendency, or drift." The purpose of this study is to prevent any such tendency to "drift" in the search for the right automotive specialties package. It is intended to encourage the formulator to avail himself of the benefits of package engineering and to set his sights at certain goals.

"To better understand the future we must understand the past," is a statement applicable to the marketing of automotive specialties. The gas station of 30 to 45 years ago featured detached "rest rooms" and complete absence of the package designer! It was a highly functional operation. The gas was delivered from a mechanical hand cranked pump. The oil, too, was in a square metal tank reservoir (sometimes on wheels) with a circular motion crank handle that delivered on each turn "about" one quart of oil. Later, as the needs of alcohol for anti-freeze developed in the northern areas a 55 gallon bulk tank was seen. This usually nestled next to the 55 gallon tank of coal oil for cooking.

These are now fond memories. The modern service station has an inventory of specialized, personalized, functional items just itching to be used in your car. What of the oil pump? Its grandchildren are there. The packaging engineer has appeared and done his job. First he developed a bottle with a metal cap. You could *see* the oil. The sight of the product was to titillate your impulse buying. However the dastardly few began to dilute the fresh oil with used oil or oil of lower grade. The answer! A metal can that was tamperproof, factory sealed, and opened before you as it was put

*Paper presented at 46th midyear meeting, Chemical Specialties Manufacturers Ass'n, Chicago, May 17.

Fig. 1 (top, left) shows three old favorite cans: "F" style, tripletite and friction can and lock top.
Fig. 2. Aerosol cans (top, right) are used for wide range of automotive chemical specialties products.
Fig. 3 (lower left). Cans have even found their way into the automobile as oil filters.
Fig. 4. New "Flip-Cap" molded polyethylene fitment is designed to replace metal nozzle with screw cap.

Fig. 5. Some adaptations of plastic parts to metal containers and some interchanges between metal and plastics. Last can on right has flow control fitment.

into the car. And now the grandchild—the aluminum oil can, still tamperproof but now lighter weight, easier to open, and non-rusting.

The rest of the station has also changed. The rest rooms have moved indoors. The pumps are electric and may pump up to six different types of gas per pump. And the antifreeze comes in various size cans to meet your needs. The label may even tell you how much to use for your car and on the shelf will be found six ounce oil cans for the foreign car enthusiast who can't use or store 32 ounces of motor oil.

During these thirty years the efforts of the various segments of the packaging industry to improve the packaging of automotive products has resulted in a flood of new products in metal, plastic, glass, fiber board, and paper. Further, the way the consumer will actually use the product has been considered, and in some cases, this has dictated the type of package.

Three types of cans have been available a long time—the "F" style can, the tripletite and friction can and the lock top can. (Fig. 1) In the last few years products packed in these cans have markedly increased in numbers.

The aerosol can (Fig. 2) has entered the field as container for products ranging from touch-up paints to silicone insulating and protective sprays. Ease of application, ability to get the product into difficult-to-reach areas, and other conveniences have brought the aerosol into the automotive field. Cans have even found their way directly into the car as an oil filter. (Fig. 3) Small replacement components for cars in cans are also on the shelves. In the last few years the improved technologies of metal and plastic-forming have been combined to offer the convenience and advantages of both materials.

A recent introduction (Fig. 4) is the "Flip-Cap." This molded polyethylene fitment was designed to replace the metal nozzle with the screw cap. The dispensing opening is available in a range of colors and sizes from 3/64 to ¾ of an inch. This particular development, using plastic and metals, offers the following advantages for fluid or particulate products:

1. Less cost to the packer for the complete package;
2. Increased filling rates;
3. Easy opening and uniform closing for the consumer;
4. No possible losing or switching of the cap;
5. Ability of the packer to utilize full lithography on can ends.

Some adaptations of plastic parts to metal containers and some interchanges between metal and plastics are illustrated in Fig. 5. Starting from the left, a standard can is shown utilizing a plastic pump to dispense a tire cleaner in spray form. Next are four blown plastic bottles, two opaque, two permitting product inspection. First of the four plastic bottles dispenses a leather cleaner and features the added convenience of a little plastic brush for dirt removal. The two containers on the extreme right are metal cans with plastic dispensing units. The first simply substitutes an all plastic unit for an old metal screw cap, which makes for a more attractive appearance and better assurance of container integrity. The last can has a fitment permitting control of liquid flow by movement of the nozzle tip through a 40° arc. When the tip is returned to the original position, the can is once more sealed.

Fig. 6. Three piece aluminum cans for motor oils.

Figure 7. Composite container (left), made from foil-kraft-foil sandwiches now being used for powdered products. Modern glass package offers advantages of product visibility, product protection and attractive appearance.

No longer does the gas station constitute the only outlet for automotive products. A recent national survey of companies controlling over 1750 retail outlets of the supermarket type indicated that 48 per cent of these stores carried antifreeze, 39 per cent motor oil, and 37 per cent paint. Since such nonfood items yield high profit per square foot of shelf space, they are due for further promotion in the future.

What of tomorrow—the future? It presents unlimited challenge. In the immediate future aluminum and lighter weight plate will be of great importance.

Aluminum is not a new can making material. In this country it has been used since 1933 as can material for packaging tuna fish. However, since 1956 and 1957 the three piece aluminum oil can (Fig. 6) has emerged in large volume and has also been tested for antifreeze. Between 50 and 60 per cent lighter than their steel counterparts these cans are also resistant to corrosion by certain products and lend themselves to easy opening features and special design. As the material cost per container is becoming more competitive, one may expect to see more aluminum packages.

The advent of lighter weight tinplate offers new advantages in rigid containers, which are worthy of attention. Since World War II, the trend has been toward use of less and less plate in the package. In the immediate future tin plate will be commercially available in base weights well below any previously considered usable. This will mean emergence of new packages.

Every effort is being made to avoid over-packaging and to tailor the container to the required shelf life of the product. Industry has recognized that there is no need for a package for eternity—it just costs too much. Aluminum and lighter weight tinplates are materials which will help toward solution of these problems.

Advantages of product inspection combined with product protection and attractive appearance are offered by modern glass packages. (Fig. 7) For dry products, composite containers, made from foil-kraft-foil sandwiches, have entered the market. The incorporation of pull or tear string easy-opening devices conbined with improved decoration has made this container most attractive for specific products. And, in the last two years, (Fig. 8) an extrapolation of this type of thinking has led to the "Blister Pack" for dry and solid products. This is a fascinating and functional package offering 180° product inspection through an attractively formed plastic container. In addition, the backing can carry a message in a range of colors and the consumer has the assurance he has purchased a tamperproof container for his product.

These are some of the materials that are available for packaging automotive products.

Further in the future we may find the convenience philosophy—so prevalent in the food field and aimed at the consuming housewife—appearing in the automotive field. (If this does come to pass, let us hope the future still belongs to the man of the house to tinker with and "fix" the car.

Where may packaging develop a repeat market in the automotive field? The concept of "do-it-yourself" lends itself directly to automotive products in rigid containers, for "screw-it-in" or direct attachment. Visualize the availability of replaceable containers for windshield wiper fluid; providing an aerosol touch-up kit with each new car; or some form of cartridge for insertion in air conditioned cars; an air purifier, if you would. With the introduction of automotive jacks for cars, compressed gas kits for their operation may soon be with us as brothers to today's fire extinguisher. This would be a

(*Turn to Page* 176)

Figure 8. "Blister Pack" for packaging of both dry and solid products offers 180° product inspection through attractively formed plastic container.

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What makes a product belong? Acceptance by the consumer public . . . acceptance for the product itself . . . and acceptance for the container in which it is presented for sale. • A good product is greatly enhanced at the point of sale when presented in an attractive glass container . . . a glass container by Brockway. • Brockway provides individuality in a glass container . . . the kind of individuality that makes your product stand apart from all the rest, thereby providing a strong advantage at the point of sale. • A product that is worthy of consumer acceptance deserves a quality glass container by Brockway.

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packaging notes

Metro Glass Names Swan

The appointment of Charles H. Swan as midwestern regional sales manager of the Metro Glass

Charles Swan

Division of National Dairy Products Corp., Jersey City, N. J., was announced late last month. Mr. Swan has 19 years experience in the glass container industry, all spent in midwestern markets. Before joining Metro he was with Owens Illinois Glass Co., Toledo. Midwestern sales offices of Metro Glass are located in Chicago.

—★—

Embassy Labs in New Plant

Embassy Laboratories, Inc., private label cosmetic manufacturer, has moved into new quarters at 52-10 37th St., Long Island City 10, N. Y., tripling the space of its former plant in Brooklyn, Edward Sagarin, president, announced late last month.

For the manufacture and filling of a wide variety of cosmetics, six automatic high-speed lines have been installed at the new quarters. One of the lines consists of a 12-spout MRM machine for gravity filling of household detergents, shampoos, bubble bath, and other high-foaming liquids. Two other filling lines are for small units, both liquids and creams, which are particularly adapted for filling from one-fourth dram to two ounces; another is for hand work in class perfumery that requires special tying, sealing, and other handling.

Other officers of Embassy include Franklin Cooper, secretary-treasurer and plant manager, and Isadore Bronfein, research and production chemist.

—★—

Metal Tubes at Record High

A record of 1,150,013,808 collapsible metal tubes were sold in 1959, according to a recent report by the Collapsible Tube Manufacturers Council, N. Y. The 1959 figure is a 14 per cent increase over the 1,004,947,488 tubes produced in 1958. Increases were reported for most end uses with the largest gains in cosmetic and pharmaceutical packaging. The use of metal tubes in cosmetic packaging increased by 33 per cent over the 1958 total, from 78.1 million to 104.1 million. Toothpaste manufacturers accounted for 581.2 million tubes in 1959, an increase of 13 per cent over 512.9 million in 1958. Use of metal tubes for shaving cream, however, decreased by nine per cent from 43.4 million in 1958 to 39.1 million last year.

Fornero to Cosmetic Firm

Last month Patricia Stevens Cosmetics, Inc., Chicago, announced the appointment of

George M. Fornero

George M. Fornero as general sales manager. Mr. Fornero formerly served as regional sales manager for Continental Filling Corp., contract packaging firm, Danville, Ill.

—★—

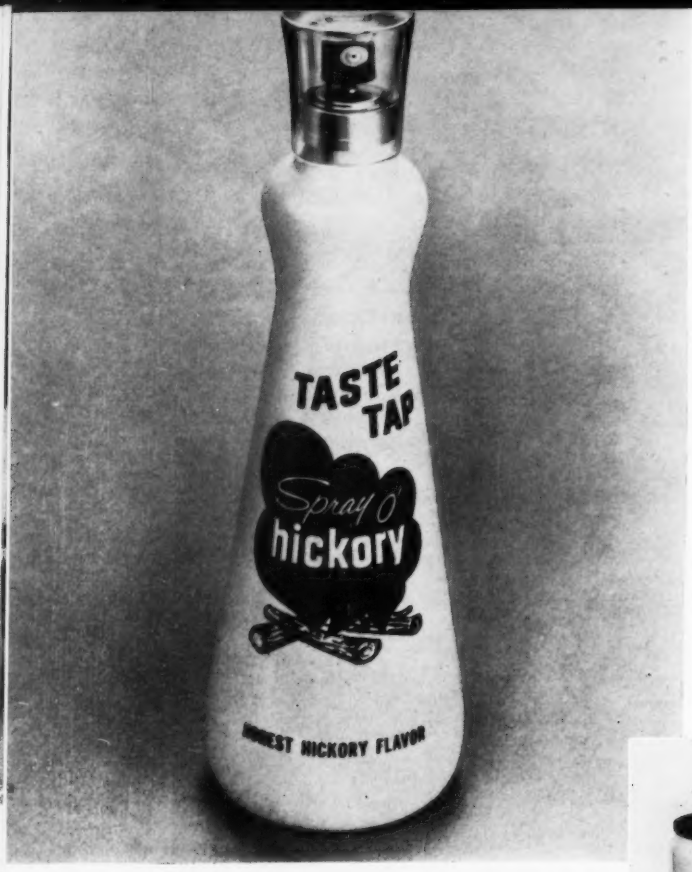
New Design Administrator

Samuel Kalish, former head of Sakana Corp., was recently named to the newly created position of design administrator for Yardley of London, Inc., New

(*Turn to Page* 125)

New snap-cap closures for specially designed tooled neck glass vials in one, two, three and four dram sizes, are offered by Demuth Glass Works, Inc., Parkersburg, W. Va., subsidiary of Brockway Glass Co. Prime internal seal with outer portion of cap providing supplemental seal and secure lock makes good container for hygroscopic dry materials. Combination lends itself to automatic capping.

WHAT'S



A new idea in food seasoning, pressure packaged "Spray O'Hickory," was announced recently by Gard Pressure Foods Corp., Northfield, Ill. Product is designed for use on meats and poultry, as well as a flavoring for sauces, soups, casseroles, gravies, omelets and cooked vegetables. "Taste Tap Spray O'Hickory" gives off natural hickory log aroma and imparts a dark crisp look, aids in searing, maker says. Packed in three ounce, plastic-coated glass bottle, product retails for 79 cents.

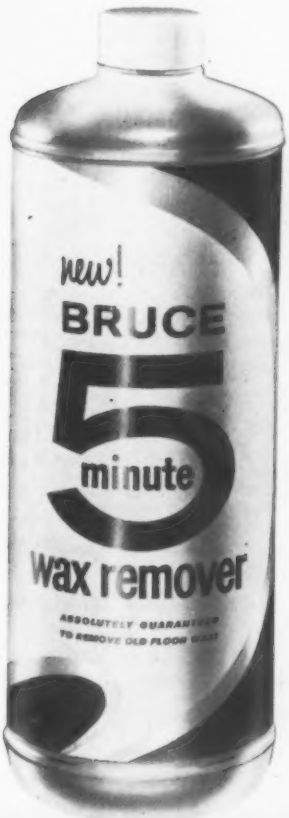
New packaging for a new product: Butcher Polish Co., Malden, Mass., last month introduced "White Crown" floor wax, which is designed to eliminate problem of yellowing. To lend a hand in merchandising the new wax, Butcher is packing each five-gallon container in a special polyethylene jacket to protect its colorful lithography. Company feels, according to Alvan Alley, Butcher marketing manager, that "polyethylene jacket on each Five will help our distributors to deliver a better looking container to their customers." Wax, which is designed for use on "all floors, including white and light pastel shades," also comes in one, 10, 30, and 55 gallon package sizes.

Introduction of new lithographed five gallon pails for its "Duo-Dellay" rug and upholstery shampoo was announced recently by Stanley Hoffberger, general manager of Duo-Dellay Products, Baltimore. Container is lithographed in bright yellow, red and black for "eye appeal" and "quick" identification. The product has been "improved" by "an increase in lubrication power, coupled with less wetting action," the maker says.

NEW?

"Instant Dri-Glo," an aerosol product that makes is possible for the housewife to "wax and dust at once" was introduced recently by O'Cedar Division of American-Marietta Co., Chicago. Mechanical break-up valve, by Risdon Manufacturing Co., releases wax-in-water emulsion in extremely fine, even spray, which prevents saturation of wiping cloth and makes one step wax-dust procedure practical. Six and one-half ounce can, made by American Can Co., has a Sterling Seal 12-1 closure. Continental Filling Corp., Danville, Ill., was the filler.

Two new rug shampoo products were added recently to the line of Bryn Mawr Products, Bryn Mawr, Pa. "Re-Juvenate" rug and upholstery shampoo, includes brightening agents, and has a neutral pH. It is "quick drying" and may be used on "all fibres of all colors." The product has been designed for use with the Re-Juvenate" color system for recoloring faded rugs. Another new Bryn Mawr product is "SR-100" soil-resistant rug and upholstery shampoo. It includes du Pont "Ludox" as soil retardent. Both products are also available in one gallon polyethylene bottles, as well as in silk-screened, two color, five and 55 gallon pails and drums.



New "Bruce 5-Minute" wax stripper was announced early this month by E. L. Bruce Co., Memphis, Tenn. Product derives its name from the fact that it will "penetrate and dissolve build-ups of old wax when left on the floor for five minutes." Product is ready to use from the bottle and requires no scrubbing with steel wool to remove old finishes. According to the maker it may be used on all non-wood floors, linoleum, tile, vinyl, rubber, etc.

"Knox furnishes us clear, quality bottles," says plant manager of largest aspirin manufacturer

"Our glass bottle suppliers have to be able to meet our exacting specifications as to size, quality and color. Although breakage isn't much of a factor, we watch that closely, too," says the General Plant Manager of the world's largest producer of aspirin tablets.*

"Knox Glass has been an important supplier of bottles for us since November, 1954. We know we can count on getting the clear, absolutely colorless glass we must have when we buy from them.

"Because of increased market demand, our business is continually expanding. This underscores to us the important role that our several able glass suppliers play in our expansion.

"We are, frankly, pleased to do business with Knox. They have always been very cooperative and helpful in our dealings with them. Knox has, for example, offered the services of its engineering facilities, and while we rarely require outside assistance of this nature, it's good to know we can make use of it if we need to."

Find out how Knox Glass can meet your exacting specifications. Contact Knox Glass, Inc., Knox, Penna., or any of 37 sales offices throughout the nation.

*Name available on request.

the new/**KNOX GLASS**

New "Greenbrier" line of male grooming aids of Daggett & Ramsdell, Inc., Newark, N. J., includes shampoo, pre-shave and after-shave lotions, cologne, cream hair lotion and stick deodorant. Five liquid products are packaged in six-ounce bottles by Hazel Atlas Glass Division of Continental Can Co., New York. Bottles are slightly tapered for easy holding and to fit hand comfortably. Flat front and back panels feature red, black and gold checkerboard labels made by Gardner Neuman. Black fluted bottle caps are by Danbury Plastics. Stick deodorant, wrapped in shiny gold foil, also is packed in Hazel-Atlas frosted bottle, with black and gold closure by Crown Cork and Seal Co. Folding Cartons, by F. N. Burt, repeat red, black and gold checkerboard design of bottle labels. White corrugated sleeves surround inside of cartons and protect bottles during shipment.

(From Page 119)

York, it was announced by Philip C. Smith, president.

Mr. Kalish's responsibilities include the creation and coordination of packaging and display designs and other point-of-sale specialties for the American company. For seven years he was with Sakana Corp., his own firm of visual merchandising specialties. His formal design training was at the Parson School of Design and the Workshop School of Advertising Arts.

—★—

Marquardt in New Post

Charles H. Marquardt has just been named district sales manager of Chicago City metal can sales office at Continental Can Co., New York, it was announced last month by Frank I. Gill, general manager of the North Central district. Mr. Marquardt joined the company as a sales trainee in 1950. Prior to his new appointment he had been assistant district sales manager in Chicago and St. Louis.

Mr. Marquart succeeds Donald L. Weir, who was transferred to Continental's Hazel-Atlas Glass Division on the Pacific Coast.

—★—

Canco Realigns Executives

American Can Co., New York, recently announced the election of William C. Stolk as chairman and chief executive officer. Succeeding Mr. Stolk as president is Roy J. Sund, vice-president of Canco's Marathon Division.

Mr. Stolk has been president since 1951 and chief executive officer since 1952 when the post was vacated by the retirement of C. H. Black. Mr. Sund has been a director, vice-president in the corporate executive department, and general manager of the Marathon Division.

Mr. Sund and William F. May, corporate vice-president and general manager of the Canco Division, were elected members of the executive committee of the board of directors.

—★—

William C. Stolk

Roy J. Sund

New Plax Plant

Plax Corp., Hartford, Conn., producer of plastic containers, recently purchased approximately 12 acres of land in Sharonville, O. A building of 60,000 square feet, to be erected on the site is expected to be ready for occupancy late in 1960, and will employ 70-100 employees. Plax also has manufacturing facilities in Stonington and Deep River, Conn. and Ligonier, Ind.

Plax, the originator of the plastic bottle, also makes "Polyflex," oriented polystyrene film and sheet for packaging use, as part of its complete line of plastic containers ranging from 3 cc. vials to 15 gallon carboys.

New expanded polystyrene containers announced recently by the container division of Sheffield Plastics, Inc., Sheffield, Mass., are molded in variety of shapes and colors for packaging soaps, shampoos, cosmetics. Wall thickness and density of plastic can be varied to provide proper strength/weight ratio for specific applications.

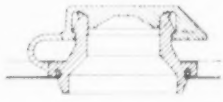
THE CAP THAT STAYS ON— EVEN WHEN IT'S OFF!

CONTINENTAL'S NEW ALL-PURPOSE FLIP CAP*

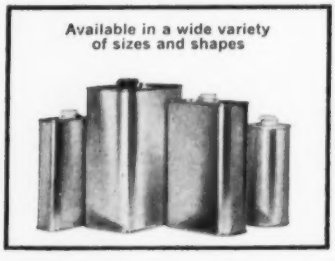
Continental presents new packaging beauty with economy and convenience, too... Flip Cap* can, with dripless pour spout, is perfect for practically all liquids and granulated products now packaged in round or oblong nozzle-type cans.

Continental's new plastic Flip Cap is permanently hinged to its dripless pour spout—snaps back and stays open, snaps shut and stays shut. Inserted into the top of the can *after* filling, Flip Cap permits higher filling speeds through a larger opening. And the top of the container can be fully lithographed—no solder splashes, no flux spots or heat scorching. For the full story, ASK THE MAN FROM CONTINENTAL!

Cap can't be lost—permanently attached by a hinge. Flip Cap is available in either ½- or ¾-inch opening, and in a variety of colors.



Applied after filling, Flip Cap nozzle can be inserted automatically at 200 per minute. Full lithography on top of can.



*Patents pending

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Central Division: 135 S. La Salle St., Chicago 3
Pacific Division: Russ Building, San Francisco 4
Canadian Division: 790 Bay St., Toronto 1
Cuban Office: Apartado 1709, Havana, Cuba

new trade marks

THE following trade marks were published in recent issues of the *Official Gazette* of the U. S. Patent Office in compliance with section 12 (a) of the Trade Mark Act of 1946. Notice of opposition under section 13 may be filed within 30 days of publication in the Gazette. See rules 20.1 to 20.5. As provided by section 31 of the Act, a fee of $25 must accompany each notice of opposition.

Permastop—This for fungicidal agent which also functions as deodorant and sanitizing agent for clothing, carpets, and other inanimate objects. Filed Aug. 12, 1958 by Everpure Laboratories, Inc., Boston. Claims use since July 10, 1958.

Spur-Tex — This for janitor supplies, namely disinfectant-deodorants and mop, brush and cloth sprays or dressings. Filed Nov. 24, 1958 by Spurrier Paper Co., doing business as Spurriers, Wichita, Kans. Claims use since on or about Nov. 1950.

Rosar — This for powdered insecticide. Filed May 18, 1959 by Alfran Distributors, Inc., Catskill, N. Y. Claims use since April 13, 1959.

All Clear — This for chemical solution for melting and removing snow and ice from glass surfaces. Filed Nov. 19, 1959 by L. K. R. Chemical Products Corp., Detroit. Claims use since Nov. 17, 1959.

Eveready—This for windshield washer antifreeze and windshield deicer. Filed Dec. 30. 1959 by Union Carbide Corp., New York. Claims use since on or about Nov. 24, 1959 on windshield washer antifreeze.

Prestone — This for windshield washer antifreeze and windshield deicer. Filed Dec. 30, 1959 by Union Carbide Corp., New York. Claims use since on or about Nov. 24, 1959 on windshield washer antifreeze.

Union Carbide—This for windshield deicer. Filed Dec. 30, 1959 by Union Carbide Corp., New York. Claims use since on or about Dec. 18, 1959.

Gold Seal — This for combustible charcoal starter marketed in a pressurized container. Filed Jan. 18, 1960 by Gold Seal Co., Bismarck, N. D. Claims use since June 17, 1958.

Chlorohepton — This for insecticide concentrate. Filed Dec. 12, 1958 by Orkin Exterminating Co., Atlanta, Ga., assignee of Louis L. Dettelbach, Atlanta. Claims use since Nov. 18, 1958.

Magnador No. 41 M.M. & R. — This for water soluble combination of essential oils and aromatic chemicals used as an air deodorant. Filed April 23, 1959 by Magnus, Mabee & Reynard, Inc., New York. Claims use since June 1, 1958.

Di-Crobe — This for germicide-sanitizer. Filed July 2, 1959 by Huntington Laboratories, Inc., Huntington, Ind. Claims use since Jan. 16, 1959.

Suplex — This for foam and scale control agent. Filed Sept. 30, 1959 by Diamond Alkali Co., Cleveland. Claims use since June 26, 1959.

Lucky-Mack King Florida — This for roach, sweet eating ant, and mouse poison. Filed Oct. 13, 1959 by McCall Manufacturing Co., Jasper, Fla. Claims use since Sept. 21, 1959.

La Holandesa — This for powdered household cleanser. Filed Aug. 17, 1959 by Purex Corp., South Gate, Calif. Claims use since Dec. 14, 1958.

Glance — This for preparation for protecting and polishing hard and resilient surfaces. Filed Nov. 16, 1959 by S. C. Johnson & Son, Inc., Racine, Wis. Claims use since March 20, 1959.

No-Buzz — This for insect-mosquito repellent lotion. Filed May 29, 1959 by Garden Protector Corp., Revere, Mass. Claims use since March 31, 1959.

Clevite — This for kit containing antistatic cleaning solution and cleaning pads for phonograph records. Filed Dec. 14, 1959 by Clevite Corp., Cleveland. Claims use since on or about Nov. 12, 1959.

Nimcolan — This for animal wax, lanolin oil, wool grease. Filed Dec. 24, 1959 by N. I. Malmstrom & Co., Brooklyn, N. Y. Claims use since Oct. 27, 1959.

Dowgard — This for chemical preparation used to prevent freezing and overheating in automotive cooling systems. Filed Jan. 25, 1960 by Dow Chemical Co., Midland, Mich. Claims use since Dec. 29, 1959.

Gracious — This for shampoos. Filed Nov. 30, 1959 by Gillette Co., doing business as Toni Co., Boston, Mass. Claims use since Oct. 1, 1958.

Empilan — This for chemical compositions for use as emulsifiers, opacifiers, stabilizers, intermediates, foaming agents, and surface active agents. Filed Aug. 27, 1957 by Marchon Products Ltd., London, England. Claims use since 1949.

Estate — This for insecticides, fungicides, milcides. Filed Dec. 20, 1957 by United Co-Operatives, Inc., Alliance, O. Claims use since April 8, 1957.

Outdoor Chef — This for charcoal lighter fluid. Filed Oct. 14, 1958 by Adams Corp., Korn Kurls Division, Beloit, Wis. Claims use since July 29, 1955.

Perchloron — This for chlorine containing powder used as bleaching agent, algaecide, bactericide, and disinfectant. Filed May 25, 1959 by Pennsalt Chemical Corp., Philadelphia. Claims use since Dec. 1957.

No Trace — This for room deodorants. Filed June 8, 1959 by Gillette Co., Boston. Claims use since May 22, 1959.

Leak-Aid — This for liquid detergent for household, institutional, and industrial uses. Filed Oct. 30, 1959 by Leakaid Products, Inc., Taylor, Mich. Claims use since about May 1, 1959.

Quadra-Solv—This for solvent cleaner. Filed Dec. 1, 1959 by Panther Oil & Grease Manufacturing Co., Fort Worth, Tex. Claims use since Oct. 1, 1959.

P-Q—This for antifreeze. Filed Dec. 4, 1959 by American Oil & Supply Co., Newark, N. J. Claims use since Oct. 20, 1959.

Cosmederm—This for medicated shampoo. Filed Sept. 4, 1958 by Richard Hudnut, Morris Plains, N. J. Claims use since Aug. 5, 1958.

Quadra-Sheen—This for synthetic detergent cleaner. Filed Dec. 1, 1959 by Panther Oil & Grease Manufacturing Co., Fort Worth, Tex. Claims use since Oct. 1, 1959.

Lively—This for laundry detergents. Filed Dec. 7, 1959 by Automatic Enterprises, Inc., Lancaster, Pa. Claims use since Sept. 7, 1959.

MP—This for mothproofer and mildewproofer. Filed Aug. 28, 1959 by J. I. Holcomb Manufacturing Co., Indianapolis. Claims use since Aug. 13, 1959.

Linco—This for liquid and dry bleaching agents—namely ammonia, sodium hypochlorite, dichloro dimethyl hydantoin, and sodium perborate. Filed Oct. 16, 1959 by Linco Products Corp., Chicago. Claims use since Dec., 1959.

Sof Stroke—This for aerated shaving cream. Filed Nov. 27, 1959 by Mennen Co., Morris Township, N. J. Claims use since Oct. 2, 1959.

Super Speedy—This for combinations of soaps and synthetic type detergents for industrial and household use. Filed June 12, 1959 by Columbia Soap Co., Paterson, N. J. Claims use since July, 1947.

"Wee Moderns"—This for soap. Filed Nov. 20, 1959 by Saks & Co., New York. Claims use since June 15, 1959.

Tifit—This for liquid detergent composition for general household usage. Filed Dec. 15, 1959 by Murray F. Howard, Greenville, S. C. Claims use since Nov. 21, 1959.

Brief — This for all purpose cleaner. Filed Dec. 16, 1959 by Lan-O-Sheen, Inc., St. Paul, Minn. Claims use since Nov. 4, 1959.

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Yes, Precision's roots are deep . . . its aim high!

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Aerosol Loading in Italy

In interview, Milan custom loader, who also makes valves and filling equipment, explains differences, similarities in U.S.

HEADACHES and compensations of the aerosol loader in Italy are both like and unlike those of his counterpart in the U. S.

This we learned from Dr. Mario Ramella, head of Solfrene S.p.A., manufacturer of filling equipment, licensee for Risdon's valves, and custom filler. Of an estimated 20,000,000 units filled in Italy Solfrene fills between four and five million. Yet Dr. Ramella took pains to explain that custom filling is not what he wants to do —primarily. He only does it when he must. For this he gave two reasons: A custom filler needs enormous warehouse space, "a whole city," as he put it. And he does not wish to compete with his customers, the loaders who use his machinery and his valves.

Today there are four valve manufacturers in Italy, two of them licensees of U. S. firms, and seven contract fillers. The other U. S. licensor must be Precision Valve, we assume, since Dr. Ramella said that Precision "is very important" in Italy.

All metal aerosol containers made in Italy are of aluminum, Dr. Ramella said, adding that their use is free from corrosion trouble for most systems but not for all. He mentioned as an exception hair sprays, where the interaction of alcohol with propellant mixture 11/12 creates a corrosion problem in aluminum cans leading to a rejection rate of 10 per cent and more. For such products tin plate containers are imported from Germany. A mixture of propellants 12 and 114 would minimize corrosion but increase costs.

Glass containers are used for pharmaceuticals and cosmetics. All coated glass aerosol bottles turned out in Italy are made under a Wheaton license, according to Dr. Ramella. When asked about uncoated glass aerosols he said that he himself was not very keen on them but that some small units were being made uncoated. However, and this is an interesting sidelight, marketers carry liability insurance on each uncoated glass pressure package sold. Insurance costs two lire or about ⅓ cent per unit. Reason for this precaution: "Many bad claims," as Dr. Ramella put it, especially in the South of Italy. In that area about one half million small uncoated pressurized glass packages of hair brilliantine are sold a year.

Fluorinated hydrocarbons predominate as propellants. They are low priced, 11/12 mixture being available at 300 lire (about 21.8 cents) per one kilo cylinder in quantities. This reasonable price is due to a price war currently being waged among European fluorinated propellant producers. These include such giants as Montecatini in Italy and Imperial Chemical Industries in Britain. Next year another competitor is expected in the fluorinated hydrocarbon arena: Edison, S.A., a major producer of hydrofluoric acid.

Low cost natural gas butane and propane are being used extensively as propellants. They are brought from near Hanover, Germany. Dr. Ramella does not see much immediate growth for nitrogen filling except for certain pharmaceutical products. Italians are not willing to pay extra for pressurized toothpaste, he pointed out.

Dr. Mario Ramella, right, head of Solfrene, S. p. A., Milan aerosol loader, with Walter C. Beard, Jr., director of research for Risdon Manufacturing Co., Naugatuck, Conn. Photo was taken at Risdon's research laboratory during recent visit to U. S. of Dr. Ramella. His firm is exclusive licensee of Risdon in Italy.

This remark brought us to the subject of products and markets. About 60 per cent of all pressure packages sold in Italy are insecticides, Dr. Ramella estimates. Most of them are bought in Southern Italy. Their importance to the consumer may be measured by the fact that a working man earning perhaps 1000 lire a day may spend 500 lire on an aerosol bug killer. There are no aerosol insect repellents in Italy, we were told.

Room deodorants are important, accounting for possibly 1½ million units. Among pressure packed cosmetics hair lacquers take first place, with sun screens and hand lotions coming next.

The pharmaceutical market is important, growing and diversi-

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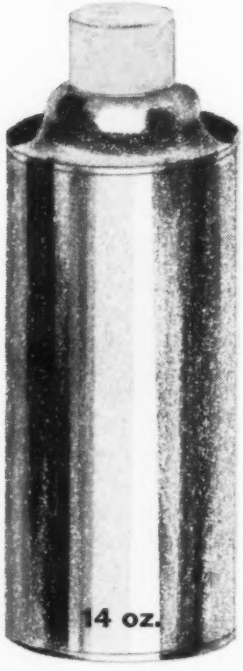

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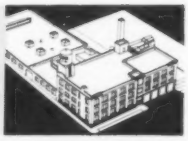

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fying rapidly. We inquired whether any pressure packages were being marketed in Italy which are unfamiliar to the U. S. consumer and found that Italians use a pressure packaged floor wax. It can be sold at a competitive price because it is loaded with low cost propane.

Turning from the Italian pressure packaging picture in general to Solfrene's operations in particular, we found that the firm is the licensee for Risdon valves and actuators not only in Italy but also in Germany, and that it has a sublicensee for these products in Brasil. In addition Solfrene sells valves in Belgium, Holland, Austria and Switzerland. With the Common European Market in mind, Dr. Ramella is planning to install production facilities in Darmstadt, Germany, which, he hopes, will be on stream by October of this year.

Solfrene engineers and builds aerosol loading lines for pressure and cold filling operations. It has designed and is offering for sale a special small pressure loading plant which is currently being used by Elizabeth Arden, Carven, and Lubin in Italy and France. Dr. Ramella informed us that he has developed a new process for loading which is currently being patented and which he intends to introduce to the United States in the not too distant future.

In addition, Solfrene sells customer service. The firm prefers not to do any more custom filling than absolutely necessary. When we asked the meaning of this statement, Dr. Ramella outlined what he considers his rightful task: to iron out for the customer all bugs involved in using aerosol components, to fill the first 10,000 or 20,000 units of a certain product, if necessary then to install Solfrene's equipment in the customer's plant, sell him the valves, supply an expert free of charge for a month or two if necessary. The contract filler or marketer is then on his own, until new problems arise. To illustrate his meaning he quoted the case of Squibb's pressurized shave cream. The firm had problems crimping the aluminum can, Solfrene's technical men moved in and ironed the wrinkles out of their line.

In spite of all this, Solfrene loads about 38,000 units a day by cold and pressure filling methods. The firm employs 10 technical people and 150 operatives. Most of the latter are employed in hand assembling valves at the rate of 40,000 conventional and 20,000 metered valves a day. Automatic valve assembly has so far not been installed because the size of the market did not warrant it. Dr. Ramella expressed hopes of adopting the American system of automatic assembly. Small orders and demands for a wide variety of actuators tailored to individual products handicap the departure from hand assembling methods.

Dr. Ramella stressed the dirth of aerosol technicians. He has instituted a training scheme to remedy the situation. Currently he

(*Turn to Page* 135)

pressure packaging

Barnett to Gene Rose

The appointment of Eugene L. Barnett as technical director of Gene Rose Co., Chicago, contract

Eugene L. Barnett

aerosol loader, was announced late in June. Mr. Barnett was with National Detergents, Inc., for five years, as chief chemist in product development, before joining Gene Rose. Before that he was with Armour & Co., Chicago, working in pharmaceutical research.

In his new post Mr. Barnett succeeds Charles Mellick, who recently joined Hysan Products Corp., Chicago. One of Mr. Barnett's functions as technical director will be to coordinate expansion of the firm's research and development facilities.

A Chicagoan by birth, Mr. Barnett is a graduate chemist. Following his study in chemistry, he did graduate work in biochemistry at the Illinois Institute of Technology.

—★—

Renews Aerosol Grant

General Chemical Division of Allied Chemical Corp., New York, announced late last month that it was renewing its grant in aid of $3,000 to the College of Pharmacy, St. John's University, Jamaica, N. Y., for aerosol research for the year beginning Sept. 1960.

The program is concerned with the solubility and stability of pharmaceuticals in aerosols, and was initiated last year under the direction of Dr. John J. Sciarra, associate professor of pharmaceutical chemistry at the University. General Chemical has renewed the grant in aid to the program as an extension of its own aerosol research and technical service programs which embrace all types of aerosol product development.

The College of Pharmacy at St. John's is one of several institutions now devoting part or all of their development programs solely to aerosol research. It has one of the newest and largest specialized aerosol research laboratories in the country.

—★—

New Sprayon Managers

Appointment of three new regional managers was recently announced by Sprayon Products, Inc., Cleveland custom aerosol loading firm.

Edwin O. Bergdahl has been named western regional manager, in charge of 11 western states, with headquarters in San Leandro, Calif. He has been with Sprayon as a manufacturer's representative for four years.

William C. Murphy has been appointed midwest regional manager, covering Michigan, Illinois, Indiana, Wisconsin, Minnesota, Iowa, and Missouri, with offices in Milwaukee. He was formerly with Reynolds Metal Co.

John R. Sinding, new eastern regional manager, is situated in Wynnwood, Pa. His territory includes New England, Virginia, metropolitan New York, and eastern Pennsylvania.

—★—

Risdon Adds Plastics

Risdon Manufacturing Co., Naugatuck, Conn., metal fabricator of small components, aerosol and cosmetic containers, recently announced that it has added a plastics division to its operation.

Established to serve Risdon's own need for plastic components in conjunction with metal parts, it will also produce for other com-

(*Turn to Page* 135)

Herman R. Shepherd, center, president of Aerosol Techniques, Inc., Bridgeport, Conn., contract loader, is joined at recent commencement exercises of Columbia University by Dean E. Leuallen, right, and Dr. Joseph Koenig, both of the College of Pharmacy. Mr. Shepherd is a trustee of Columbia's pharmacy college.

New, six-ounce, two-piece aluminum aerosol container, without side seam, was announced recently by C. L. Alexander, vice-president of American Can Co., New York, and general manager of Canco's Bradley-Sun Division. Cans are being produced on high speed (35 million a year) machines at Bradley-Sun's plant in Washington, N. J. Prices range from $50 per thousand plain, to $53 for cans decorated in four colors and with double internal lining. Because of the shape of the can, there are possibilities for greater decoration. With the can's shoulder and body consisting of a single piece of metal, the area open for design runs unbroken from valve fitment to bottom of can. Because the can is seamless, it is possible for a continuous decoration to be carried around the outside of its body. A number of internal coating systems designed specifically for an aluminum can have been developed by the Canco research center in Barrington, Ill.

(*From Page* 133)

panies. It is now producing components of nylon, polyethylene, polystyrene, and "Delrin" for use in cosmetic containers and aerosol valves.

For Risdon's aerosol division, the new division is making valve actuators, cores, cups, and dust covers. Both cosmetic containers and aerosol valves are assembled and finished at company plants in Danbury.

—★—

CMCS Meeting

Announcement of the third annual meeting of the Canadian Manufacturers of Chemical Specialties Association was recently made. It will be held October 24-26, 1960, at the Queen Elizabeth Hotel, Montreal, Quebec.

Italian Aerosol

(*From Page* 132)

employs 10 16-year old boys as apprentices in the European sense. They must serve a number of years before they are qualified as skilled workers in the field. A number of young men who have completed their training have been sent to Brazil and other locations. While benefitting the industry as a whole, it is easy to see that such emissaries carry the belief in Solfrene's products wherever they go.

Turning the conversation to pharamceutical aerosols and their special problems Dr. Ramella told us that a major pharmaceutical house has installed a development and testing laboratory in Solfrene's plant. Pressed further on this intriguing statement he explained that his customer has set up complete laboratory facilities employing one pharmaceutical and two analytical chemists and two technicians.

Dr. Ramella told us that he refuses to sell a customer when he finds him unable to make successful use of his machinery, valves and services within a reasonable period.

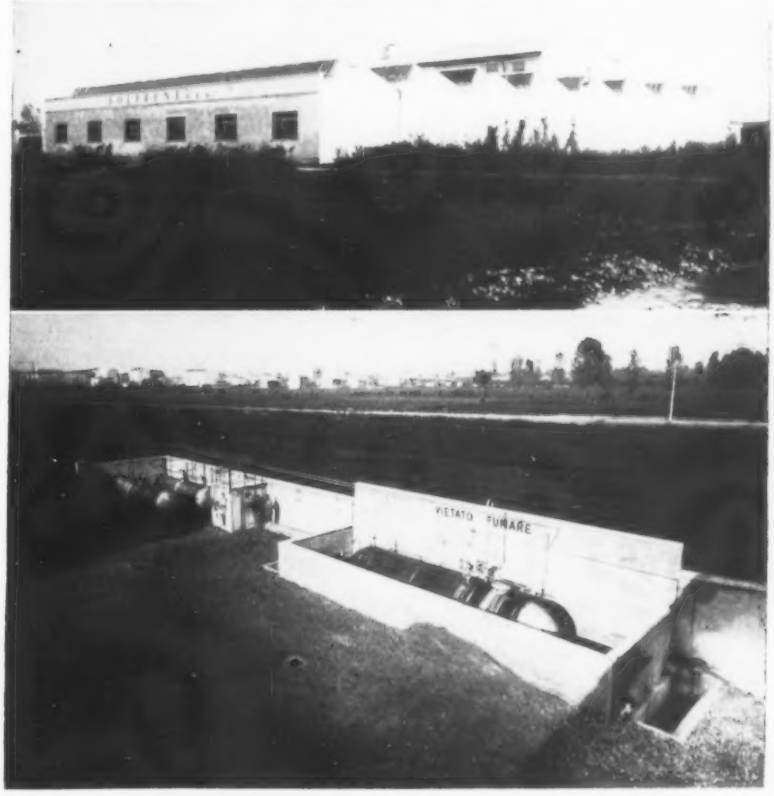
—★—

Maru Acquires Aero-Chem

Acquisition of Aero-Chem Fillers, Inc., Bridgeport, Conn., contract aerosol loading firm, by Maru Chemical Co., Stratford, Conn., was announced recently. Aero-Chem, founded in October, 1958 as Aero-Chem Laboratories, becomes a wholly-owned subsidiary of Maru. The parent company is successor to Kataonah Chemical Co. and Berkshire Chemical Co., Bridgeport loaders, previously headed by Rudy Beers.

President of Maru and newly acquired Aero-Chem is M. M. Bassick. Mr. Beers is vice-president in charge of production, and Charles Rader, former president of Aero-Chem, becomes vice-president in charge of sales of both Maru and Aero-Chem.

Solfrene plant near Milan, Italy, makes Risdon valves under license; engineers and builds aerosol filling lines of all types; and does custom filling. Propellant tanks (below) store flourinated hydrocarbons, propane and butane.



Production...

EQUIPMENT · MATERIALS · PROCESSING

Ribbons of soap coming off chilling roll during one phase of the drying operation. As ribbons are scraped from chilling roll they fall on the feed conveyor or apron which elevates soap to uppermost portion of a soap drying chamber. See page 150.

Modern Toilet Soap Drying

By Heinz Zilske,
MIAG Muehlenbau und Industrie G.m.b.H.
Braunschweig, Germany

THE toilet soap industry used drying cabinets as standard equipment for many decades. This drying method is not very economical and adds to the cost of the soap. Its use may result also in considerable variations in fatty acid content of the soap chips and create processing problems. Bars made from such chips may show scales and cracks. These faults permit penetration of moisture far into the interior of the bar. Absorption of the water is accompanied by swelling of the soap and, due to the consequent increase in bulk, the bar is bound to crumble sooner or later.

Soap may be allowed to dry naturally or may be dried by artificial means. Natural drying, formerly common practice, calls for the soap to be formed into slabs, then chipped and the chips to be air dried on trays. The method is cheap and causes little loss of alkali, so that the soap can be made with an almost neutral pH. On the other hand, this process lends itself only to occasional toilet soap manufacture on a small scale. It does not yield a high production rate.

Medium size and large soap making operations require processing methods which permit drying of sizable batches as continuously as possible. Such plants confine themselves to artificial drying methods of which there are five: hot air; roller; spray; vacuum; and expansion drying.

Typical representative of modern hot air drying methods is the belt or conveyor band drier, still giving satisfactory results in many soap plants. Efficiency of this type of equipment depends on the direction of the hot air stream. Suction yields better drying results than pressure.

At one time drying by rollers was popular in the soap industry. But, since rollers are apt to yield soap chips of varying fatty acid content, their popularity has waned.

Spray drying was considered a promising method for processing toilet soap. One attempted to spray the soap slurry including all ingredients except fragrance; to cool and perfume the resulting fine dust and to work it into bars in hydraulic presses, all in one continuous operation. However, the high expectations for spray drying did not materialize. Each spraying operation, instead of yielding granules of uniform size was found to give granules ranging in size from 0 to several microns. Such differences in particle size cause non-uniform color in the final product and objections by the ultimate consumer.

Although experiments with spray drying yielded no direct results they were far from wasted, since they formed the basis for two new drying systems—the vacuum and the expansion dryer. Both offer considerable advantages over other methods, although they differ greatly from each other.

Vacuum Driers

Several types of vacuum driers exist, but all of them work on the same basic principle. Soap heated to about 170°C. is sprayed into a vacuum chamber. Atomization and moisture loss cool the soap and cause it to harden immediately on the inner wall of the cylindrical chamber. Removed by a rotating scraper, the soap is then charged into a worm type amalgamator. Soap dried by this process retains all the faults caused by atomization. An extensive series of experiments showed the following factors to be the main cause of varying fatty acid content in soap chips made by this method:

a. Nozzles fail to divide a stream of liquid into particles of uniform size; differences in surface dimensions are known to exist. Moisture evaporation is practically confined to the surface, therefore smaller particles must have a higher fatty

Expansion dryer, most recent soap drying system, removes moisture under air tight conditions, although no vacuum is formed, an advantage shared with vacuum drier

acid content than larger particles. Differences, however, are smaller than in band dried soap. In vacuum drying, moisture removal is instantaneous and particles are therefore very small and vary over a limited range of microns.

b. Material forced through a nozzle is expelled in the form of a cone. Particles traveling in or near the center of the cone cover a shorter distance and are more closely surrounded by slurry than those traveling near the outer wall of the cone. The latter have a higher fatty acid content.

c. Spraying always produces some particles so minute that they occur as dust. Provisions are made to collect the dust but this is rarely achieved completely. Some of the tiny particles are left to settle and cake where the scraper does not reach them. Later they drop off the wall at irregular intervals and in an overdried condition. Their number increases with rising soap temperature and vacuum.

d. If, for any reason, the temperature of the chamber's interior wall is raised it becomes impossible to completely scrape the soap off the wall. Later these remaining particles will drop off or be removed by the scraping device and may impair the uniformity of the fatty acid content of the chips.

The vacuum dried soap, still full of imperfections, is charged into a screw press, forced through a perforated disc at about 40°C. ("Strangpresse") and shaped into round filaments which are cut into certain lengths by a rotating knife. This intensive working of the soap mass serves to largely equalize the differences in fatty acid content but it will not eliminate them entirely. Results can be improved by using the finest possible perforations in the circular sieve. High pressures and increased power supply are needed to force the soap mass through such a disc.

Vacuum drying requires a source of heat. The standard steam kettle, part of every soap plant, is usually sufficient for this purpose. Other requirements are a vacuum pump and water supply adequate for the creation of a sufficiently high vacuum.

Principle of this drying method is well known: The soap is heated by steam in a heat exchanger to about 170°C. Corresponding counter pressure in the heat exchanger causes the soap moisture to be retained in the form of water. In the vacuum chamber this water evaporates due to spontaneous lowering of the boiling point. The soap is chilled and solidifies at about 75 per cent fatty acid content. This percentage can be adjusted within certain limits by variation of temperature and vacuum.

The vacuum drier removes moisture in an "explosive" manner and yields soap of very fine crystalline structure. Actually chilling, crystallization and solidification occur practically simultaneously. When vacuum drying was first introduced it was believed to be the only system capable of yielding soap in the beta phase. This assumption has not been confirmed.

Soaps dried in vacuum installations tend to show a glassy structure which may impair the color of the final product. This phenomenon is caused by rapid heating of the soap from 80° to 170°C and subsequent spontaneous cooling of the mass. It is further intensified by the fact that the hot soap is submitted to vigorous kneading and forced through the sieve under high pressure. Addition of titanium dioxide will minimize the glassy appearance.

Expansion Drier

Most recent of all soap drying installations is the expansion dryer. Although no vacuum is formed, moisture is removed under airtight conditions, an advantage which this system has in common with the vacuum drier. However, the drying process proper takes a slightly different course: Soap is heated to 170°C, just as in vacuum drying, but corresponding counter pressure is maintained only at the start and is gradually reduced while the soap remains in the heat exchanger. Consequently the water/soap system is slowly converted into a steam/soap system. However, owing to the high speed of flow separation of soap and steam occur only when the mixture reaches the expansion chamber.

There is a basic difference in the number of calories to which the soap is exposed in the two systems. The vacuum drier exposes the soap to the number of calories required to heat the mass to 170°C. These calories do not suffice to evaporate, at ambient atmospheric pressure, enough of the soap moisture to leave it with 75 per cent acid content. For adequate moisture removal the temperature must be raised considerably or a vacuum must be used.

Soap treated in the expansion drier reaches a temperature no higher than 170° but receives a much larger dose of calories, than in the vacuum system. Therefore water evaporation under very slight pressure in the expansion chamber is sufficient to yield a 75 per cent soap.

The following features are characteristic of expansion drying:

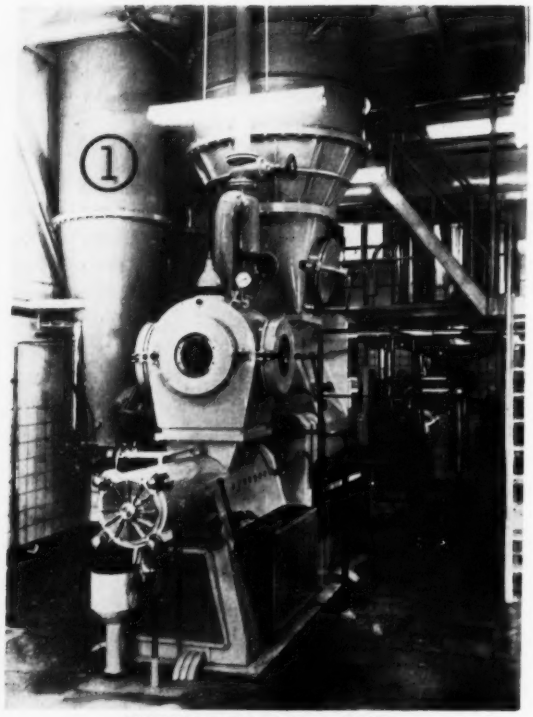
1. Every particle entering the expansion chamber is exposed to identical conditions.

2. The vapor/soap mixture flows from the heat exchanger into the expansion chamber at a definite preset temperature. At the slightest deviation, the soap stream is automatically returned to the soap reservoir where it remains until the automatic controls have adjusted the steam supply and the preset soap temperature has been restored.

3. Pressure in the expansion chamber is accurately adjustable ensuring that moisture removal occurs under airtight conditions and that the soap does not spontaneously pass from the hot molten to the cold solid state.

4. The liquid 75 per cent soap remains 15 to 20 minutes in the expansion chamber where it is vigorously agitated for uniform fatty acid content and formation of beta phase.

G. MAZZONI, S. P. A.



VACUUM COOLER & DRIER

CONTINUOUS VACUUM PLANTS

For cooling, drying and extruding all kinds of soaps up to 84% T.F.A. Capacities range from 100 to 10,000 Kgs. per hour.

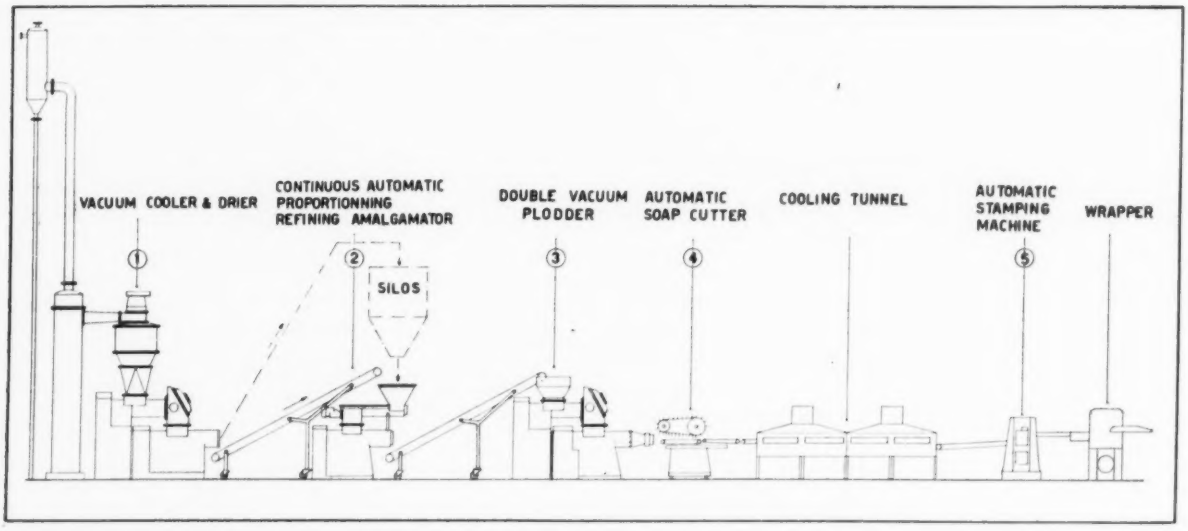
The "MAZZONI" continuous soap plants are outstanding because:

They are economical: Their requirements for steam, water and power are extremely low! Only one operator is required! No scrap soap is produced!

They perform better: 100% "Beta Phase" is guaranteed and gives extra mildness and extra foam even without coconut oil . . . no twisting or distortion!

They are extremely flexible: The same plant also can manufacture pure or built household soaps, flake and powder dried base, etc. from 35 to 84% T.F.A. and more.

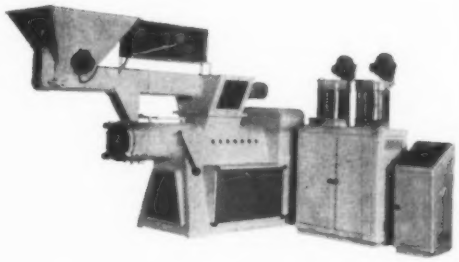
NEW! SPECIALLY DESIGNED LINES FOR SYNTHETIC TOILET BAR!!



Layout of our continuous toilet soap line. Fully continuous or batch processing possible using chips silos. Our line automatically produces fully refined, first class toilet soap with no roll mills. The individual machines that are employed in the above sketch appear on this and the facing page. A complete line or individual units are available with production capacities of 250 to 1500 Kgs. per hour.

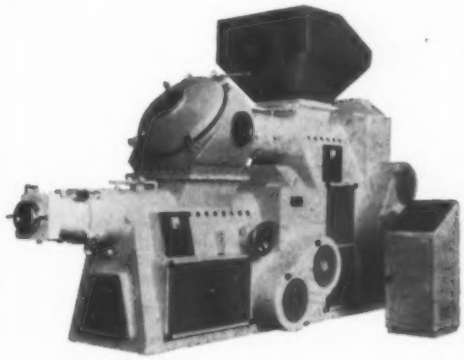
BUSTO ARSIZIO—ITALY

2



CONTINUOUS AUTOMATIC PROPORTIONING REFINING AMALGAMATOR

3



DUPLEX — DOUBLE VACUUM PLODDER
Refiner and Extruder

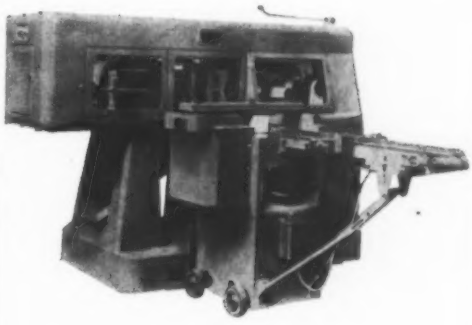
MORE THAN 300 MAZZONI PLANTS ALL OVER THE WORLD

Units shown on this page are available individually. They appear as numbered in production line diagram on facing page.

4

AUTOMATIC SOAP CUTTER "TV"
Adjustable cutting length by means of handwheel

5



AUTOMATIC SOAP STAMPING MACHINE
Type "St-S" stamping speed up to 125 per minute.
Type "St-D" stamping speed up to 240 per minute.
Type "St-O" for capacity molds. Stamping speed from 100 to 200 per minute.

Your inquiry is welcomed! We send, without obligation, data sheets and other literature on this equipment. Let our staff solve your manufacturing problems! We want you to get the most from your raw materials!

5. Steam formed by moisture removal is recondensed and may be used to heat lower coils of the heat exchanger, the soap reservoir or other parts of the installation. Condensation to about 2 ato has been found most economical. Considerable savings in steam consumption can thus be achieved.

6. Careful cooling in accurately adjusted stages takes the place of spontaneous chilling from 170° to 40°C. Consequently long grained extremely plastic soap is obtained rather than a finely granulated powdery product.

7. Slow cooling of the soap from 100°C to the solidification temperature of 60°C is accompanied by continuous agitation of the mass by specially designed chilling rollers or in cooling screw presses.

8. Operating costs are reasonable, since the installation requires only steam in addition to power needed for pumps and agitators. Steam requirements can be cut considerably by condensing and reusing vapor removed from the 63 per cent soap, as indicated above.

9. The expansion drier is versatile and adaptable to any sudden demands, since output capacity can be multiplied by relatively minor increases in steam pressure and temperature.

10. Foolproof engineering and a high degree of automation permit troublefree operation with no more than one worker in charge of the process.

11. Use of the expansion drier permits manufacture of various types of soap with special characteristics. Either transparent or opaque chips can be turned out, as desired.

12. Absence of dust formation ensures uniform fatty acid content of the chips thus eliminating the need to catch soap agglomerates by the use of very finely perforated discs. This in turn reduces power requirements of the cooling press and steps up the economy of the entire installation.

Soap processed in the expansion drier may be worked into "noodles" weighing about 0.6 g/cc;

(*Turn to Page* 166)

soap plant observer

By Willis J. Beach
Technical Service Department,
Sugar Beet Products Co.

OBJECTIONS were raised by the trade recently against a state agency invitation to bid on a liquid cleaner concentrate. In his capacity as member of a committee concerned with specifications, the author was asked to review the specifications. A few of the points requiring clarification are set forth here in the hope of encouraging improved organization and wording of such specifications.

The invitation called for a "cleaner concentrate" – a very general term indeed! Later, in the body of the specification it is revealed that the product is intended for all types of floors, particularly for marble, terrazzo, asphalt and vinyl tiles and concrete. Finally, at the end of the description and by way of a reference to an accepted proprietary brand, the reader learns that the cleaner is to be used in automatic floor scrubbing machines. The desired product is described as a "diethanol amine type of cleaner concentrate, nonionic and must be anionic." We note also that it must "perform cleaning task by chemical reaction," and that "there shall be nothing in the cleaner concentrate which will burn the floor or hasten the build-up of alkali ice."

This somewhat contradictory and vague information, together with some further data offered in the specification, serves to characterize the product only in the minds of those who have the background to interpret the description properly. The requirement is for a fatty acid – diethanolamine condensate probably modified to repress suds for effective use in the floor scrubbing machines.

Such a vague specification can result from lack of technical knowledge, from inability to organize the requirements adequately, or from a desire to obscure the issue and preclude free and open competition required by law in the public interest.

So much for poorly conceived specifications! How about the other side of the picture –specifications not being met and the fact being ignored. An editorial in *Maintenance and Sanitary Supplies* not so long ago posed a question that often plagues us: *"How can a soap which meets a specification be sold at a price which is actually below the cost of the ingredients involved?"* "The answer is simple," says the editor. "The specification is not met."

Judging by some samples received at our laboratory recently, we are inclined to agree with the editor. These samples come in from the field and represent a good cross-section of the products submitted by industry to meet customers' specifications. Even more alarming is the fact that most of these items were actually bought under a specification and are being used day after day.

The editorial (speaking in this instance about industrial hand soaps) goes on to say: "The soap is shipped and the distributor trusts to heaven that it is never tested. Otherwise his price would be higher – and he might not get the order.

"Shipping products that do not meet specifications is not wholly chicanery on the part of the distributor alone. Sometimes purchasing departments are involved. Yes, purchasing departments for large, outstanding companies, companies which buy soaps in large quantities to supply needs of thousands of employees in numerous plants. The purchasing department is always interested in making its work look good and can well wink at products which do not meet specifications if the price is right. If the product gets by, who is to know if it contains 35 per cent soap or 20 per cent? And the purchasing department is tabbed as smart because it makes a good buy.

"Our feeling is, that some specifications were set up mostly to be circumvented, to make pretty reading for the upstairs brass. As for the distributor who quotes to meet the specification–his honesty can be costly."

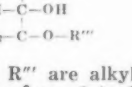
The editor certainly has a point in this last statement, for we have found this situation too costly all too often. But there is another aspect of the specification problem that we would like to bring up. Even with the best of buyer intention, a specification for a chemical specialty based solely on ingredients may facilitate the purchase of a satisfactory product but won't insure it.

(*Turn to Page* 177)

new patents

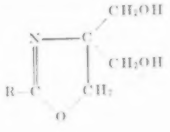
Listed below are brief abstracts of recently issued patents. Complete copies may be obtained from the publisher of this magazine: — Mac-Nair-Dorland Co., 254 W. 31st Street, New York 1, N. Y. Remit 50¢ for each copy. For orders received from outside of the United States send $1.00 per copy.

No. 2,932,616. Detergent Compositions, patented by Edward S. Blake, Dayton, O., assignor to Monsanto Chemical Co., St. Louis, Mo. Claimed here is a detergent composition consisting essentially of the reaction product of about 10 to 20 mols of ethylene oxide with 1 mol of a glycerol-1,3-dialkyl ether having the structural formula:



where R″ and R‴ are alkyl radicals each containing from 6 to 16 carbon atoms, a sodium polyphosphate selected from the group consisting of tetrasodium pyrophosphate, sodium tripolyphosphate and mixtures thereof, soda ash, and carboxymethyl cellulose, said components being present in about the ratio of 1:2:1:0.05 in parts by weight.

No. 2,932,617. Detergent Composition Containing 2-Alkyl-4,4-Bis (Hydroxymethyl) Oxazolines, patented by Vincent Lamberti, Hackensack and Mark D. Konort, Fort Lee, N. J., assignors to Lever Brothers Co., New York. A heavy duty detergent composition is covered essentially of an alkali metal dodecyl benzene sulfonate in an amount to impart detergency to the composition, a detergent polyphosphate and an amount of from about 0.5 to about 5% to enhance the sudsing and detergency of the sulfonate of a 2-alkyl-4,4-Bis(hydroxymethyl) oxazoline having the formula:



where R is an aliphatic hydrocarbon radical having from nine to thirteen carbon atoms.

No. 2,931,776. Denture Cleanser Composition, patented by Richard Skipworth Howard, Elloughton, England, assignor to Reckitt & Colman, Ltd., Hull, Yorks., England. Described is a tablet for the preparation of an aqueous cleansing solution, said tablet consisting essentially of a mixture of an inorganic persalt which slowly releases active oxygen in aqueous solution selected from the group consisting of a percarbonate and a hydrated perborate and at least one alkaline alkali metal inorganic detergent salt with from about 4 to 30% by weight of a compound selected from the group consisting of the anhydrous forms of sodium, potassium, ammonium, calcium and magnesium perborates which on addition to water effervesce and rapidly release gaseous oxygen.

No. 2,931,777. Germicidal Detergent Compositions, patented by Herman Alder Shelanski, deceased, late of Philadelphia, by Bessie Shelanski Rosen, executrix, and by Harry Fair, trustee, both of Philadelphia, assignors to General Aniline & Film Corp., New York. The invention consists of a germicidal detergent composition comprising a mixture of a liquid water-soluble, nonionic detergent of the formula

$$R(CH_2—CH_2—O)_nH$$

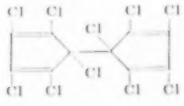
wherein R represents the residue of a water-insoluble organic compound containing at least 6 carbon atoms and having an active hydrogen, and n represents an integer of from 6 to 50, and a germicidally effective amount of elemental iodine.

No. 2,932,618. Engine Deposit Removal, patented by Paul E. Oberdorfer, Jr., Claymont, Del., assignor to Sun Oil Co., Philadelphia. Claimed is a solvent formulation for the removal of engine deposits which comprises from about 10 to about 70 volume percent of a cyclic carbonate inner ester selected from the group consisting of ethylene carbonate, propylene carbonate, butylene carbonate and amylene carbonate, from about 10 to about 30 volume percent of an organic polar solvent selected from the group consisting of acetone, dimethyl acetal, methylal, methanol, methyl ethyl ketone, ethanol, and isopropanol, and mixtures thereof, and from about 20 to 60 volume percent of an aqueous solution selected from the group consisting of acetic acid and compounds capable of yielding acetic acid by thermal decomposition.

No. 2,934,471. Synergistic Insecticide Composition Comprising a Pyrethrum Type Toxicant, an Insecticide and a Butadiene Furfural Condensation Product, patented by Roy E. Stansbury, Bartlesville, Okla., assignor to Phillips Petroleum Co. This patent teaches a method of killing insects which comprises applying to insects an insecticidal composition comprising an insecticidal ingredient, a pyrethrum-type toxicant, and a small repellent and synergistic amount of a compound having the following general structural characteristics:

wherein R is selected from the group consisting of hydrogen and methyl, R'_m is selected from the group consisting of hydrogen, methyl and chloro, R'_n is selected from the group consisting of hydrogen, methyl and chloro, at least one R is hydrogen, at least two R'_m's are hydrogen, and at least two R'_n's are hydrogen.

No. 2,934,470. Insecticidal Perchlorocarbon, patented by John T. Rucker, Lewiston, N. Y., assignor to Hooker Chemical Corp., Niagara Falls, N. Y. Revealed is a process for protecting material susceptible to attack by insects which comprises applying to said material an effective amount of a perchlorocarbon having the formula



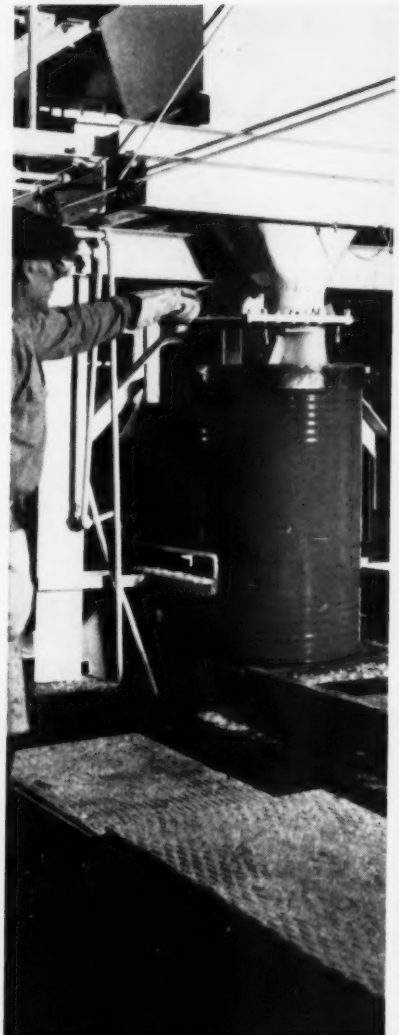
No. 2,931,780. Defoaming Compositions and Process, patented by Charles S. Steiner, Homewood, Ill., Earle Fritz, East Chicago Ind., Jack M. Becktel, Chicago, and William H. Kloster, Naperville, Ill., assignors to Swift & Co., Chicago. A method is described of suppressing foam in a media normally having the tendency to foam excessively, which comprises: incorporating in said media a small but sufficient amount of a substantially sterol-free mixture of fatty acids, rosin, acids, and unsaponifiable materials, said mixture being derived from tall oil pitch by extraction of said tall oil pitch with a liquid normally gaseous hydrocarbon, and removal of the sterols.

No. 2,938,827. Insecticide, patented by Francis T. Wadsworth, Dickinson, and Paul D. May, Galveston, Tex., assignors to American Oil Co., Texas City. Covered is a concentrate useful in forming insecticidal compositions effective against sucking-type insects which comprises between about 10 to 50% by weight of bis (methylthio) methane, between about 1 to 15% by weight of an emulsifier, and the remainder a hydrocarbon distillate, said concentrate being capable of dilution with water to form an insecticidal composition containing between about 0.001% and 1.0% by weight of bis (methylthio) methane.

HOW TO BUY CAUSTIC SODA EXPERTLY

Jerry W. trimmed a tidy two thousand dollars from shipping costs. When process needs for liquid caustic inched up in Jerry's plant, freight costs galloped along beside them. Jerry's Hooker man suggested a switch to barge delivery. Together, they worked out purchasing and shipping schedules—and a solid saving on freight.

All Hooker plants and most stock points are on or near deep water. If you use large amounts of 50% liquid caustic soda, and you can take water delivery, you might save with barge shipping.



Ralph S. repackaged the size he ordered. Ralph's company wanted to add a new product to its line of cleansers. Problem: to get a flake caustic soda that wouldn't dust off to a smaller size. When Ralph placed his next order for caustic, he discussed flake sizes with his Hooker representative. Result: he found there was no problem. Flake sizes are tightly controlled at Hooker. Flake is thick enough to stand up in shipping. Ralph was able to get the size he ordered, without waste.

A purchasing agent helped design his plant's caustic soda handling system. When Elmer K.'s plant was modernized, its caustic handling system became hopelessly outdated. Elmer tipped off the plant superintendent about the design assistance available from Hooker. They called their Hooker man who put them in touch with a Hooker engineer. As a result, the whole system was revamped along more efficient lines—with engineering help from Hooker that cost Elmer's company nothing.

DID YOU KNOW THERE ARE 11 WAYS TO BUY HOOKER CAUSTIC SODA?

Liquid 50% • Rayon Grade Liquid 50% • Liquid 73% • Rayon Grade Liquid 73% • Solid • Regular flake • Crystal flake • Fine flake • Powder • Phosphated • Special alkali.

Somewhere among these varieties is a new source of profit for you. Your Hooker man can help you find it. Why not get in touch with him.

HOOKER CHEMICAL CORPORATION
107 Union Street, Niagara Falls, N. Y.

HOOKER CHEMICALS PLASTICS

Sales Offices: Buffalo Chicago Detroit Los Angeles New York Niagara Falls Philadelphia Tacoma Worcester, Mass. *In Canada:* Hooker Chemicals Limited, North Vancouver, B. C.

products and processes

Improved Soap Perfume

Alpha - methylbenzalacetone is suggested as replacement of benzalacetone in soap perfumes. The methyl compound is said to have better cutaneous properties and can therefore be used in higher concentrations than benzalacetone. Good alkali stability and fragrance properties as well as economy in use are claimed for methylbenzalacetone. Horst Schmidt in *Seifen, Oele, Fette, Wachse*, 1960, No. 10, p. 297.

—★—

Chromium Cleaner

Preparations designed for the cleaning, derusting, and general care of chromium may contain the following components:

Formula I	parts
Diatomaceous earth	25
Ammonium oleate	2
Light mineral oil	14
Ammonium oxalate (rust remover)	3
Aqueous ammonia	0.5
Pine needle oil	2
Water, hot	53.5

Formuula II	parts
Diatomaceous earth	6
Triethanolamine	3
Bentonite	0.5
Orthodichlorobenzene	10
Oxalic acid (rust remover)	0.5
Water, hot	8

Procedure for Formula I, for instance, might be: Ammonium oleate is warmed and mixed with aqueous ammonia, then diatomaceous earth is slowly stirred into this mixture. Ammonium oxalate is dissolved in hot water and the solution added to the above combination. Finally mineral oil and pine needle oil are stirred into the product.

A chromium cleaning and protecting paste can be formulated from "Vaseline" and petroleum. Paraffine and/or microcrystalline waxes can be added to adjust consistency. If a mild abrasive is desired a little siliceous chalk or very fine alumina can be incorporated. *Seifen, Oele, Fette, Wachse*, 1960, No. 11, p. 336.

—★—

Zein Based Floor Finish

Good scuff resistance, gloss, leveling properties and freeze-thaw stability are claimed for self polishing emulsion floor waxes based on resin dispersions with "Zein G-210," corn gluten derived industrial protein. A number of sample dispersions are suggested by Corn Products Sales Co., New York, manufacturer of "Argo Brand" zeins. Following are examples of dispersions of "Zein G-210" and a resin which can be blended with wax emulsions in desired ratio:

Example I

	parts by weight
Shellac (bleached, dewaxed)	100
Aqueous ammonia, 28%	15
Water	750
"Zein G210"	100
Aqueous glutaraldehyde, 25%	18
"Sartticizer 8" (Monsanto)	40
Aqueous ammonia 28%	10
Water	760

Example II

	parts by weight
"Durez" resin 15546 (Durez Plastics Div. of Hooker)	100
Aqueous ammonia 28%	15
Water	750
"Zein G210"	100
Aqueous glutaraldehyde, 25%	18
Urea	20
Aqueous ammonia 28%	10
Water	780

In both instances the resin is slurried in the water, ammonia added, and stirring continued until dispersion is complete. "Zein G-210" is slurried separately in the second portion of water containing glutaraldehyde and plasticizer (urea in solution) and when well wetted ammonia is added. Stirring is continued until dispersion is complete. Zein and resin dispersions are then mixed and are ready for blending with the desired wax emulsion.

—★—

Fungicide/Surfactant

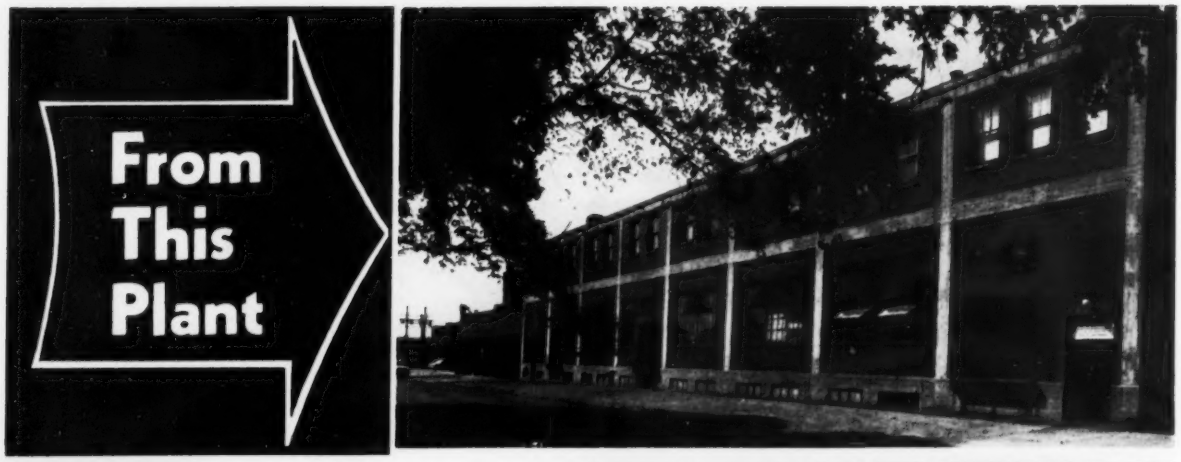
The established fungicidal properties of undecylenic acid synergized by the surface active properties of fatty acid alkylolamines are claimed for undecylenic acid monoethanol amide (UMA). Fungistatic shoe sprays, antifungal detergents, shave creams, soaps, shampoos, bubble baths, floor polishes, are some of the products where potential uses for UMA are seen. In addition to its antifungal properties the substance is said to act as foam booster and stabilizer in such products as bubble baths.

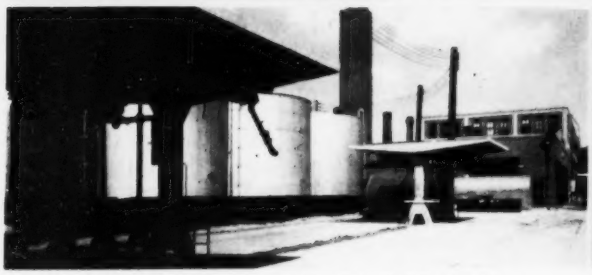
Use concentrations of two to three per cent UMA are suggested for cream shampoos, aerosols, soaps, and bubble bath preparations. One per cent is said to suffice for therapeutic purposes, and 0.1 to 0.5 per cent for prophylactic additions. G. A. Nowak in *Dragoco Report*, 1960, No. 4, p. 97., published by Dragoco, Inc., 250 West Broadway, New York, 13.

—★—

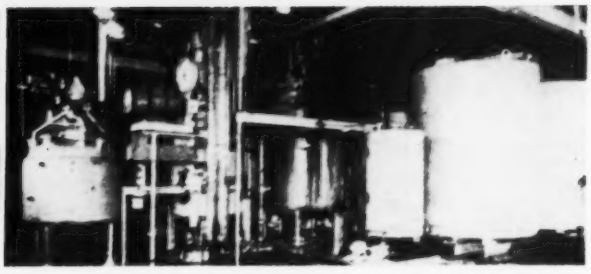
Roaches Carry Food Germs

A recent study at Kansas State University, Manhattan, Kan., by T. H. Lord, bacteriologist, and his associates, found that out of 100 captured groups of brown-banded cockroaches, about a fourth contained staphylococcus aureus, the bacterium responsible for food poisoning. Mr. Lord reported that his findings make it reasonable to assume that food poisoning germs may be spread to good food by the insects. Control of the insects is difficult, Mr. Lord pointed out, since this species travels several hundred feet looking for food and a warm, dark hiding place. They also may be transported into previously exterminated areas in corrugated cardboard boxes or laundry.





Ample tank storage for efficient bulk material handling.



Modern equipment assures product consistency and uniform high quality.

Krystall stands ready to meet your detergent requirements

When it comes to filling your detergent requirements you can depend on the Krystall Chemical Co. With our efficient plant and modern laboratory plus an excellent technical staff we are ready and able to handle your surfactant needs.

Our plant has bulk storage for up to 600,000 gallons of raw materials and finished products including storage facilities for handling stabilized liquid Sulfur Trioxide. Warehouse space for over 2000 drums of finished materials, and 600 feet of railroad siding. Facilities for simultaneous loading and unloading of 10 trucks and 5 railroad cars.

Krystall Chemical Co., primarily a manufacturer of detergent intermediates also offers extensive compounding and packaging facilities. We have just installed another new, high speed automatic filling line for handling either plastic bottles or cans.

Our technical staff will welcome the opportunity to help with your production, formulation, product development and analysis. . . . What ever problem you may have write or call us today.

SOME OF THE EXPANDING KRYSTALLEX SERIES . . .

KRYSTALLEX A—A sodium lauryl sulfate with a very low salt content and low viscosity.

KRYSTALLEX C—A sodium lauryl sulfate characterized by its high uniform viscosity—excellent base for creme shampoos.

KRYSTALLEX T—A triethanolamine lauryl sulfate with high activity, low cloud point, very light color and color stability.

KRYSTALLEX AM—An ammonium lauryl sulfate with low salt content.

KRYSTALLEX S-26—A new detergent manufactured for shampoo use.

KRYSTALLEX S-330, and KRYSTALLEX S-365—Purer forms of alcohol sulfates recommended especially for rug and upholstery cleaning.

KRYSTALLEX S—A conventional type of dodecylbenzene sulfonic acid.

KRYSTALLEX SX—A pure form of dodecylbenzene sulfonic acid.

KRYSTALLEX S-63—A specially purified sodium dodecylbenzene sulfonate. Clear and odorless liquid. Excellent base for all types of liquid detergents.

KRYSTALLEX S-75—An ammonium alkyl phenoxyethylene sulfate.

KRYSTALLEX LX—Triethanolamine alkyl aryl sulfonate, 60% active.

KRYSTALLEX LA—A non-ionic fatty acid alkanolamide manufactured for use as a foam stabilizer.

KRYSTALLEX CD—A coconut fatty acid alkanolamide useful for thickening, etc.

KRYSTALLEX CDA—A modified coconut fatty acid alkanolamide used in floor cleaner concentrates. Has outstanding resistance to hard water.

KRYSTALLEX LIQUID DISHWASHING DETERGENTS—Completely formulated products ready for dilution and packaging.

Krystall chemical co.

Phone Bittersweet 8-2325 • 1301 W. Belden Ave., Chicago 14, Ill.

"SPECIALTY ORGANIC CHEMICALS"

New Industrial Mixer

A new industrial mixer called the "Industrial Ribbon Blender," was introduced recently by The Strong-Scott Manufacturing Co., 451 Taft St., N.E., Minneapolis 13, Minn. Designed to prevent contamination from one batch to another, the machine can mix dry and semi-dry materials. Features of the mixer are rounded tube ends to prevent batch material from hanging in corners; curved discharge gates; and newly designed shaft seals and couplings. It is available in either stainless or carbon steel in nine capacities from 16 to 300 cubic feet.

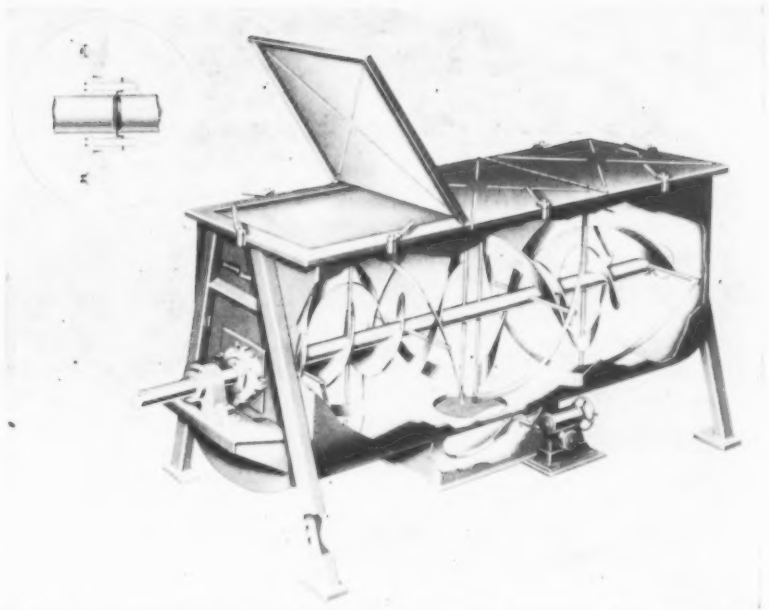
—★—

New Spray Nozzle

A new wide angle spray nozzle with full spray pattern, said to be the first of its kind, has just been placed on the market by Spraying Systems Co., 3217 Randolph Street, Bellwood, Ill. Average spray angle of 110° gives wide coverage within short distance, while square spray pattern on manifold multiple nozzle installations permits total coverage while keeping spray overlap to minimum.

Square spray full jet nozzles come in capacities ranging from 5.9 to 48 gallons per minute at 30 psi, in choice of male and female pipe connections.

New wide angle spray nozzle of Spraying Systems, Inc., Bellwood, Ill.



New industrial ribbon blender type mixer announced recently by Strong Scott Manufacturing Co., Minneapolis. Available in 16-300 c.f. capacities.

New Data on Zeins

"Argo Brand Zeins G-200 and G-210" are described in a new 10 page illustrated booklet published recently by Corn Products Division, Corn Products Sales Co., 9 East 55 Street, New York 22. Self polishing floor waxes, varnishes, inks and other chemical specialties are among actual and potential applications for these industrial proteins.

Zeins are extracted from corn gluten. "G-200" is soluble in alcohol; "G-210" is dispersible in water with mild alkali. Both are soluble in aqueous alcohols, an unusual property in industrial proteins, according to the manufacturer. Said to exhibit good film forming, adhesive and binding characteristics, the zeins are claimed to have good resistance to microbial attack.

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New Builders Bulletin

A new four-page bulletin entitled "Setting Up an Aerosol Laboratory" has been prepared by Builders Sheet Metal Works, Inc., New York. The bulletin discusses reasons for setting up a laboratory, sources of literature, equipment needed and safety precautions that should be observed. Copies of the bulletin are available from the firm, which manufactures a full line of laboratory and small scale aerosol filling equipment.

—★—

Pennsalt Charts Products

How to tell stockholders in a nut shell what their company makes and where its products go has been solved by Pennsalt Chemicals Corp., Philadelphia 2, Pa. Every copy of Pennsalt's 1959 report to stockholders carries on the inside cover, tipped and folded, a simplified production chart. Shown are basic raw materials, intermediates, flow of processing, and resulting products, each identified by easy symbols. Major end uses are shown for trade named products. Not everyone of the firm's products is shown but the chart presents major groups.

Entitled "Pennsalt's Products, Where They Come From, How They're Made," copies of the chart are available from Pennsalt.

—★—

Borax Data from Stauffer

A 21 page illustrated brochure entitled "Borax and Other Boron Compounds" has just become available from Stauffer Chemical Co., 380 Madison Avenue, New York 17.

SOME PERFORMANCES HAVE NEVER BEEN EQUALLED—

STANDARD FOR SKYSCRAPERS—Reaching majestically 102 stories and 1,250 feet into the sky, the Empire State Building is the world's tallest. In addition, a 222-foot television antenna towers above the building. Revolving searchlights installed on the 90th floor can be seen 300 miles away. More than 1,000,000 people visit the observation floor annually.

Look at Pine Oil

Someday someone may build a taller building than the Empire State Building —but it hasn't been done yet. And someday someone may invent a better all-round ingredient for disinfectants and cleaning compounds than pine oil—but as yet pine oil remains the standard.

Pine oil, of course, adds much more than a pleasant scent to compounds. Its wetting properties, solvent action, bactericidal properties, and safety are well known.

Pine oil, which has been in short supply for many years, is now readily available due to increased productive capacity. Look to Hercules for all the pine oil you need.

And look, too, at Hercules® pine oil's performance as a high-powered solvent:

	Kauri-Butanol Value
Pine Oil	**500+**
Toluol	105
Naphtha, H.A.	95
Turpentine	55
Naphtha, VM&P	34
Mineral Spirits	32
Kerosene	23

When everything is considered, pine oil still remains the outstanding ingredient for quality cleaners and disinfectants.

Pine Chemicals Division, Naval Stores Department

HERCULES POWDER COMPANY

INCORPORATED

900 Market Street, Wilmington 99, Delaware

NY60-1C

News...

PEOPLE · PRODUCTS · PLANTS

M. H. Marcuse Dies at 85

Expansion Joint Group

LaPorte Honda Racer, Homo

Clifford Simonis President

Michael P. Frawley, executive vice-president of S. T. Babbitt, Inc., since he joined the firm in January, 1958, was elected as president June 15. He succeeds Marshall S. Lachner, who resigned as president and a director after two and one half years as president of Babbitt. Further details on p. 153.

IN YOUR IMPROVED PRODUCTS . . .

Jefferson SURFONIC® Surface-Active Agents make the best kitchen helpers

Men are nice to have around but not so dependable in the kitchen as your work-saving products that contain SURFONIC® Surface-Active Agents. Virtually every item she keeps beneath the sink is made better by the broad modification properties of these Jefferson surfactants . . . low-foaming laundry detergents, low- and high-foaming liquid detergents, general purpose cleaners, germicidal detergents, sanitizers, metal cleaners, and many others. And indirectly, the cost of our foods is reduced by the use of surface-active agents in insecticides and herbicides.

SURFONIC® Surface-Active Agents are adducts of ethylene oxide and nonyl phenol (N-series 10 to 300) or tridecyl alcohol (TD-series 30 to 150). These surfactants are nonionic and have excellent wetting, detergency, solubility, penetration, dispersion, emulsifying and compatibility properties. They are stable over a wide range of conditions.

Write for free comprehensive technical bulletin, "SURFONIC® Surface-Active Agents" . . . Jefferson Chemical Company, Inc., 1121 Walker Avenue, P. O. Box 303, Houston 1, Texas.

Ethylene and Propylene Oxides, Glycols, Dichlorides, Carbonates
SURFONIC® Surface-Active Agents • Ethanolamines • Morpholine
N-Alkyl Morpholines • Polyethylene and Polypropylene Glycols
Piperazine • Piperazine Salts • Nonyl Phenol • Caustic Soda

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JEFFERSON CHEMICALS

NEWS

Frawley Succeeds Lachner at B. T. Babbitt

THE election of Michael P. Frawley as president of B. T. Babbitt, Inc., New York, was announced last month following a meeting of the board of directors. At the same time the board elected Alfred I. Schimpf chairman of the board and chief executive officer, and John W. Sugden executive vice president in charge of marketing.

Alfred I. Schimpf

John W. Sugden

Mr. Frawley succeeds Marshall S. Lachner, whose resignation as president and a director was was accepted prior to the election of new officers. Mr. Lachner, president of Babbitt for the past two and one-half years, has joined Revlon, Inc., New York as a senior vice-president.

Mr. Frawley has been executive vice president since he joined Babbitt in January 1958. Previously he had been general sales manager of the household products division of Colgate-Palmolive Co., New York, with which he was associated for 25 years.

Mr. Sugden joined Babbitt with Mr. Frawley and has been vice-president and director of marketing during the same period. Before 1958 he had been with Colgate-Palmolive for 12 years, and was brand manager when he left to join Babbitt.

Mr. Schimpf is an Albany banker and chairman of the Heartland Development Corp. in that city. From 1943-1956 he was treasurer of the Celotex Corp., Chicgao. The post of board chairman that he assumes has been vacant since last January. Mr. Schimpf has been chairman of the executive committee for the last several months and will retain that post.

B. T. Babbitt, Inc. headquarters are in New York, sales offices throughout the country and main plants in Albany, Baltimore, Chicago, Oakland and Vernon, Calif. The company also has subsidiaries in Canada and Brazil.

Babbitt household products include "Bab-O Cleanser," "Hep Oven Cleaner" and "Cameo Copper Cleaner." Other divisions are Charles Antell hair preparations and AnDrue Laboratories.

—★—

Shutt P & G Plant Manager

Procter & Gamble Co., Cincinnati, recently announced appointment of Edwin H. Shutt as manager of the Baltimore plant of P & G Manufacturing Co. He succeeds Paul J. Howard who moved to a new management post at P & G's headquarters.

Mr. Shutt joined P & G in 1950. He held several manufacturing management posts in the company's St. Louis and Chicago plants, before becoming manager of the Quincy, Mass. plant. This was his most recent position before his current appointment.

P & G's plant in Baltimore employs more than 500 people, and has been operating for 30 years producing household soaps and detergents.

—★—

Schreiber Joins Lever

Toby Schreiber has joined Lever Brothers Co., New York, as a product manager in the Lever division, it was recently announced.

Mr. Schreiber was with the Benton & Bowles advertising agency for five years. Before joining Lever he was senior account executive for packaged goods accounts.

—★—

Sigelbaum Joins Hysan

Moe Sigelbaum joined the sales staff of Hysan Products Corp., Chicago, it was announced late in June.

Mr. Sigelbaum was formerly

Moe Sigelbaum

with Fuld Brothers, Inc., Baltimore, in the southeast. He has many years of experience in the sanitary maintenance industry. His function is to call on Hysan's distributors in the southeast to help them develop sales.

★

New Floor Finish

T. F. Washburn Co., Chicago, recently announced availability of a new material, acrylic copolymer, for emulsion floor finishes, named "Vinaplex-40." Like its companion material, "Simplex-40," it achieves a complete resin emulsion floor polish, balanced and stable in a concentrate at 40% solids contents.

By mixing cold water with "Vinaplex-40," manufacturers, distributors, and private label packagers can make their own emulsion floor finishes in any solids wanted. The new material forms a film that is more buffable and that shows less tendency to powder, is very light in color, and has both high gloss and gloss retention, the maker claims.

For information or a sample, contact: T. F. Washburn Co., 2244 Elston Ave., Chicago 14, Ill.

★

Independent Brochure

Independent Chemical Corp., New York, has prepared a new brochure listing its 200 industrial and fine chemicals.

At the same time Independent announced that it has recently established two new stock points at Fall River, Mass., and Thomasville, N. C.

★

Jenal Toni Plant Manager

Appointment of Robert L. Jenal to the newly created post of plant manager for the St. Paul manufacturing division of the Toni Co., a division of the Gillette Co., was recently announced.

Mr. Jenal has held several executive positions since he joined the company in 1947. Before being named plant manager, he served for two years as executive assistant to the vice-president of manufacturing.

Gifford Simoniz President

Appointment of Chester G. Gifford as president of Simoniz Co., Chicago polish and wax manufacturer, was recently announced.

Chester G. Gifford

The former president, Elmer Rich, Jr., becomes chairman of the board, succeeding his father, Elmer Rich, Sr., who will assume new duties as chairman of the executive committee. Mr. Gifford previously was chairman and chief executive officer of Schick, Inc.

★

West Chemical Elects Pres.

West Chemical Products, Inc., Long Island City, N. Y., recently announced election of James E. Marcuse as board chairman. He was president at the time of his appointment, and will retain the post.

Mr. Marcuse succeeds his father, the late Moses M. Marcuse, 85, chairman of West, who died on June 20. The elder Mr. Marcuse was one of the founders of the Insecticide and Disinfectant Manufacturers' Association, now known as the Chemical Specialties Manufacturers Association, and was president in 1922. He joined West in 1903 when the firm had 10 employees; today West has 1400 employees. Later as president of West, he was responsible for major developments in the environmental sanitation field. The first liquid soap was made by West; paper towels were developed and manufactured at its paper mill; and Mr. Marcuse was instrumental in working with the federal government for industry standards.

Other elections were: Alfred W. Bressler, senior partner of the law firm, Moses & Singer, and William J. Kissell, vice president, Bankers Trust Co., as board members.

★

Dr. Moritz Dittmar Dies

Dr. Moritz A. Dittmar, 61, consumer relations supervisor in the quality-control division of Lehn and Fink Products Corp., Bloomfield, N. J., industrial chemists, died June 20. Dr. Dittmar was a graduate chemist and had received a doctorate from the University of Berne, Switzerland. He helped to establish Lehn and Fink plants in Texas, France, and South America.

James E. Marcuse, left, president and newly elected board chairman of West Chemical Products, Inc., with his father, the late M. M. Marcuse, who served as chairman of the board of directors of West until his death at 85, June 20. The new West chairman and president has been with the firm since 1927.

BUSY... BUSY... BUSY! BUT NEVER TOO BUSY TO HELP A CUSTOMER

Indeed we are busy – and that means business is *good* – but we're never too busy to tackle any new problem. Old accounts working on new products . . . new accounts being availed of our special facilities . . . these keep our large and experienced staff constantly on the alert – constantly devising fresh approaches to the age-old problem of making the customer's finished soap, toiletry or household specialty more salable through the use of attractive scent. Our success in doing this for numberless others is our best assurance that we can do it equally well for you. Why not call in our representative or a member of our technical staff for consultation?

FRITZSCHE BROTHERS, Inc.

76 NINTH AVENUE NEW YORK 11, N. Y.

Branch Offices and *Stocks: Atlanta, Ga., Boston, Mass., *Chicago, Ill., Cincinnati, Ohio, Greensboro, N. C., *Los Angeles, Cal., Philadelphia, Pa., San Francisco, Cal., St. Louis, Mo., Montreal and *Toronto, Canada; *Mexico, D. F. and *Buenos Aires, Argentina. Plants: Clifton, N. J. and Buenos Aires, Argentina.

W. F. Laporte Amer. Home Products Pres.

WILLIAM F. Laporte was elected president of American Home Products Corp., drug, food, and household products manufacturer, it was announced early this month. Mr. Laporte succeeds the late Walter F. Silbersack who died on June 6. Other elections were: Herbert E. Carnes to the newly created post of board vice-chairman; H. W. Blades, executive vice-president and a director; and Kenneth A. Bonham, executive vice-president.

As president Mr. Laporte becomes a member of the executive committee and chairman of the operations committee. He joined AHP in 1938, advancing to vice-president and a director of the corporation in 1957. At the time of his present appointment, he was executive vice-president.

Mr. Carnes joined AHP in 1936 after 22 years of service with the Bureau of Internal Revenue. He had held various positions when he was made vice-president in 1950. At the time of his current appointment he was executive vice-president. He is a member of the bar of the District of Columbia.

Mr. Blades, new executive vice-president and director, joined AHP in 1931. After holding several posts, he was made executive vice-president of Wyeth Laboratories, an AHP subsidiary. At the time of his current appointment, he was president of Wyeth, a post he will continue in.

Before Mr. Bonham came to AHP in 1951, he was president and chairman of the executive committee of the Emerson Drug Co., Baltimore. When given his present appointment, Mr. Bonham was a special assistant to the president. As executive vice-president he becomes a member of the finance committee. He is a past president of the Proprietary Association and a current member of its executive committee.

Newly elected directors of American Home Products Corp., New York, l. to r., seated: Herbert E. Carnes, vice-chairman, a new post; Alvin G. Brush, chairman; William F. Laporte, president, succeeding late Walter F. Silbersack; standing: H. W. Blades, executive vice-president and a director, and Kenneth A. Bonham, executive vice-president. Other AHP officials are, Dudley Browne, vice-president and assistant secretary; Lowell F. Johnson, vice-president for industrial relations; P. H. Hannum, treasurer; Gilbert S. McInnery, secretary and general attorney, and John G. Gaisser, comptroller.

Sterwin Sales Manager

Francis A. Baldauski, graduate chemist on the sales staff of Sterwin Chemicals, Inc., New York, was recently appointed assistant sales manager. He supervises the sales of such specialty products as flavors and certified colors.

Francis A. Baldauski

Mr. Baldauski has been a technical sales representative in the metropolitan New York area since joining Sterwin in 1959. Before that he was a development chemist for Nopco Chemical Co. With the Sheffield Chemical division of National Dairy Products Corp. from 1947-1957, he served as a research chemist, technical director, and later as manager of the sales development department.

Jefferson Advanced

Appointment of C. H. Jefferson as chief of the feed, fertilizer and pesticide section of the plant production division, Canada Department of Agriculture, Ottawa, was announced recently. He succeeds C. R. Phillips, who was named director of the division.

Mr. Jefferson joined the plant production division as an inspector in New Brunswick, transferred to Ottawa in 1948.

Intercontinental Moves

Intercontinental Chemical Corp., New York, announced that its subsidiaries, Carbic-Hoechst Corp., Hostachem Corp., Hostawax Co., and the Intercontinental accounting department, have relocated in new headquarters at 270 Sheffield St., Mountainside, N. J.

Hostachem and Hostawax offices were formerly in the Empire State Building. Their products include synthetic waxes and fibers.

Ultra Advances Young

Promotion of Richard M. Young to vice-president in charge of sales of Ultra Chemical Works,

Richard M. Young

Inc., Paterson, N. J. was announced June 22 by Dr. Henry Ruegg, president. Ultra is a wholly owned subsidiary of Witco Chemical Co., New York. In his new post Mr. Young is responsible for the sales of all company products, including packaged synthetic detergents for private-label distribution as well as bulk chemicals for industrial and institutional-cleaning applications. He joined Ultra in 1952. Mr. Young is a member of the Salesmen's Association of the American Chemical Industry and the Sales Executives Club.

—★—

S. Willard Jacobs Dies

S. Willard Jacobs, retired chairman of the Niagara Alkali Co., now merged with Hooker Chemical Corp., New York, died July 2 at the age of 73. He was a former president of the Chlorine Institute, and a member of the Chemists Club of New York.

—★—

Arthur H. Downey Dies

Arthur H. Downey, 62, vice-president of research and technology of Magnus, Mabee & Reynard, Inc., New York essential oil company, died June 13.

Mr. Downey joined MM&R in 1921 as an analytical chemist. Subsequently he served as chief analytical chemist, production superintendent, and finally, director of all scientific activities. He was active as a member of the Institute of Food Technology, the Essential Oil Association of the USA, and the National Pickle Packers Association. Mr. Downey received special recognition for his work in connection with the revision of the twelfth edition of the United States Pharmacopoeia.

—★—

Hercules Names Johnson

Richard L. Johnson was recently named a technical sales-service representative in the naval stores department of Hercules Powder Co., Wilmington, Del. He is in the firm's Chicago sales district.

Mr. Johnson joined Hercules in 1952 as a chemist at the company's research center near Wilmington. Before his present appointment he worked for two years in the development group of the naval stores department.

—★—

Kroner to Great Neck

Kroner Laboratories, Inc., New York, recently announced a change of address to 4 Ascot Ridge, Great Neck, N. Y. The firm's former address was 275 Water St., New York.

Emery Elects A. W. Schubert President

A. W. Schubert was elected president of Emery Industries, Inc., Cincinnati, it was announced late last month. He succeeds John J. Emery, grandson of the founder and president since 1925, who becomes chairman of the board, a newly created post.

Emery, producer of industrial chemicals, also announced formation of a European company, Unilever-Emery, N. V., owned jointly with Unilever, N. V., Holland. The new company has headquarters at Gouda, Holland, where construction of a plant is under way.

Mr. Schubert joined Emery in 1924. He has held the posts of secretary, director and executive committee, treasurer, and vice-president. Before his advancement he had been executive vice-president since 1953. He is a University of Cincinnati graduate. Active in business and professional organizations, he is currently on the board of directors of the Association of American Soap and Glycerine Producers, and vice-president for the midwest.

John J. Emery

At the same time that formation of Unilever-Emery, N. V., was announced, Emery disclosed that the year ended March, 1960 was the best in its 120-year history. Earnings per share of common stock were $1.50 per share, as compared with $2.25 in the preceding year. Emery's sales in the same year totaled $31,965,199.

William S. Rowe, vice-president of the Fifth Third Union Trust Co., Cincinnati, was elected to the board of directors. He succeeds his father, John J. Rowe. Re-elected as directors were William H. Chatfield, W. M. Gudmens, and Thomas Hogan, Jr. Officers re-elected were: K. K. Boyd and Robert Van Thyle, vice-presidents; H. W. Altvalter, treasurer; L. D. Myers, secretary; J. A. Mueller, assistant treasurer; and H. B. Menke, assistant secretary.

Before the recent expansion in Holland, Emery acquired a manufacturing unit in Canada, purchased a West Coast plant, and built a new plant at Nitro, W. Va., in partnership with Monsanto Chemical Co., St. Louis.

Peterson Discusses Aerosol Weight Marks

THREE questions, two of them pertaining directly to weight markings on aerosol containers, were discussed by a representative of the Chemical Specialties Manufacturers Assn. during the recent 45th National Conference on Weights and Measures, held in Washington, D. C., June 6-10. Harry E. Peterson, president of Peterson Filling and Packaging Co., Danville, Ill., as official CSMA representative, prepared and presented a paper before the conference June 9.

The first question answered by Mr. Peterson was: "Is the weight of the propellant included in the labeled net weight (of aerosols)? If so, why — since the propellant is not a usable part of the product dispensed?

Mr. Peterson answered that the propellant weight is included because it performs useful functions. It supplies pressure to dispense materials from the container; it disperses the active ingredient in usable form — thus supplying the peculiar effectiveness of many aerosols; it allows the package to be sealed, free from spillage, air contamination, or premature evaporation. Mr. Peterson cited a number of specific product examples such as insecticides, shave creams, hair sprays and room deodorants to illustrate the importance of particle size in aerosol products.

The second question was: "Why are commodities that have been traditionally labeled by liquid volume being measured by weight in aerosol containers?"

Mr. Peterson pointed out that the Department of Agriculture insists on active ingredients being marked on insecticide products in terms of percent by weight. Other reasons include the fact that since contents of most aerosol containers cannot be seen and the container cannot be opened, weight of container and how it feels when shaken are main indications for comparison between two products.

He also stated that people understand more clearly a "weight ounce" than a "fluid ounce." Also many aerosols contain ingredients whose specific volume changes significantly with temperatures. Aerosol products such as insecticides, room deodorants, hair sprays and paints will experience a liquid volume increase of more than one percent for each 10° F. rise in temperature. This is a liquid expansion rate approximately 10 times that of water-based products. Using weight designations avoids the necessity of specifying on the aerosol package a temperature of volume measurement.

The third question: "Is the industry working toward standard containers for similar products?," Mr. Peterson answered negatively. The trend, he said is toward more and different container sizes, shapes and materials.

In the first part of his paper Mr. Peterson briefly outlined the history of aerosols, described their types and compositions, as well as methods of filling. He also explained why CSMA is qualified to answer questions about the weights and measures of aerosol products.

Robert L. Ackerly of CSMA counsel's office in Washington, D. C., spoke briefly.

— ★ —

Hydrocarbon Issues Folder

Hydrocarbon Chemical Co., Inc., has just published a four page illustrated folder describing its new plant for the production of high-density polyethylene bottles for the chemical specialties industries.

Hydrocarbon's plastic division plant has blow molding equipment capable of producing from 1000 to 5000 containers a day, depending on size. The plant makes bottles of seven stock designs and is equipped to fill special orders. The company entertains facilities and staff to advise customers on their packaging problems.

The folder with details on the company's operation and products is available from the Plastics Division of Hydrocarbon Chemicals, Co., Farmingdale, N. J.

— ★ —

Simoniz Switches Agency

Simoniz Co. recently announced that its $5,000,000 per year consumer-product advertising account has been reassigned to Dancer-Fitzgerald-Sample, Inc., effective September 1960.

— ★ —

CSMA Golf Winners

Eugene McCauliff, after tying Leonard Cannella with a 77, won first low gross by winning the toss to break a tie, and thereby became the winner of the first annual golf tournament sponsored by the Chemical Specialties Manufacturers Assn. Dr. McCauliff is president of Glyco Chemicals Division of Chas. L. Huisking Co., New York, Leonard Cannella is

Gene McCauliff, third from left, winner of the first annual CSMA Golf Outing, June 16, receives trophy from George W. Fiero, Esso Standard Oil Co., president of CSMA. Looking on are H. W. Hamilton, CSMA executive vice-president, Fred G. Lodes, Lodes Aerosol Consultants, chairman of the affair; Robert E. Horsey, Givaudan-Delawanna, Inc., and John Ewald, Avon Products, Inc., of the golf committee.

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New York sales manager for Continental Can Co., New York.

The first annual CSMA golf tournament, held June 16 at Knollwood Country Club, Elmsford, N. Y., drew 146 golfers and there were 180 for dinner. A second CSMA golf outing will be held Tuesday, Sept. 20 at Medinah Country Club, Chicago. Charles E. Allderdice, Bell Co., Chicago, and Robert W. Svendsen, Chase Products Co., Bellwood, Ill., are co-chairmen for the event. Chairman of the committee for the first CSMA golf outing was Frederick G. Lodes, Lodes Aerosol Consultants, N. Y.

Third, fourth and fifth low gross winners, in that order, were T. Wyman, M. Dennos, and R. Svendsen, all with 79. First to tenth low net winners were: L. Marvinney, Tom Morgan, A. Ferrin, J. Robinson, D. Philipson, Fred Lodes, Fred Hitchings, Bill Murray, Bud Lindsay, J. O'Neil.

Peter Lind Hayes, of television fame, was closest to the pin with five feet, Earl Graham was second closest, 10 feet, and R. D. Brown was third with 10 feet, eight inches.

D. Donnelly had the longest drive, 260 yards, followed by Bart Besson, 255, and A. K. May, 250.

High gross "honors" went to Herb Koenig, who shot a snappy 162.

Among the 146 golfers (and three others) at first CSMA Annual Golf Outing, at Knollwood Country Club, June 16th.

Food Additives

(*From Page* 93)

I mentioned earlier the fact that many of you have indirectly received requests for guaranties that your products will produce no food additives problems when used in food products. The Food, Drug, and Cosmetic Act includes a provision that anyone charged with a violation of the law may be absolved of responsibility if he can show that the violative article was received in good faith under a valid guaranty as provided in the statute. The regulations we have issued set up what we believe to be such valid guaranties whether covering individual shipments or whether issued on a continuing basis. The statute in this regard, however, refers only to the articles as received and reshipped. Thus, there is no basis for relief of responsibility through the obtaining of a guaranty for some components used in the plant. The law prohibits the giving of a false guaranty but does not in any way prevent the giving of a guaranty which has no legal standing under its provisions.

Thus, a food manufacturer who obtains from the supplier of his sanitizing agent a guaranty that the use of the product as directed would result in no contamination of the food, would not be relieved of the responsibility if it turned out that the food did actually become contaminated, although, with or without a guaranty, the question might well arise as to whether the sanitizing agent supplier should be held responsible for having caused the violation involving the finished food.

We have advised inquirers of the fact that the guaranty of an ingredient or of a component used in the plant which is not the same as the finished product shipped from the plant would have no legal standing but that it would seem that any manufacturer would be willing to guarantee to a user that he is delivering precisely what he represents his product to be

No doubt there are other points for consideration, but since you have a question and answer period scheduled, perhaps we might better get to that.

—★—

Wins Safety Award

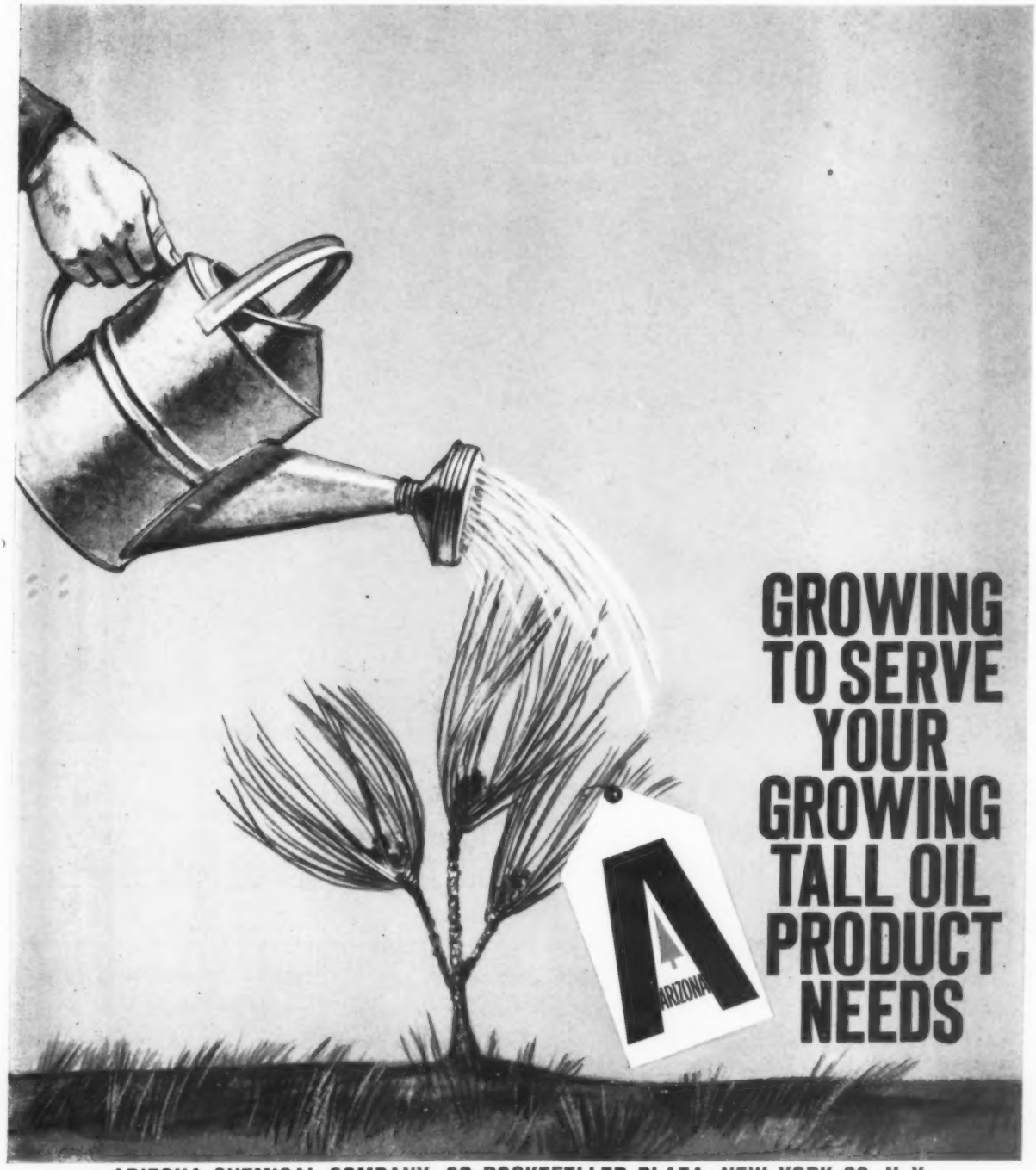
Petrolite Corp., St. Louis, has won the Award of Merit sponsored by the National Safety Council for its outstanding safety record in 1959.

Toilet Soap Drying

(*From Page* 144)

platelets weighing about 0.45 g/cc; or flakes weighing 0.3 g/cc. Following passage through a specially designed "after-crystallization" process the soap is then conveyed to the silo or storage bin by either screw or pneumatic conveyor or by elevator.

Arizona, world's largest producer of tall oil chemicals, has completed its giant new Springfield, La. plant. It will soon be in full production. The new facility gives Arizona an even larger fractionating capacity... assures you of continuous supplies of the finest tall oil products—better, faster service. Arizona research is developing tall oil products tailored to the particular needs of your industry... products to bring your operation greater efficiency and economy. This new plant is another step in Arizona's sustained effort to provide you with the best in tall oil products and service.



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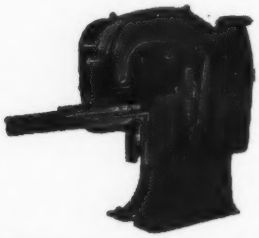

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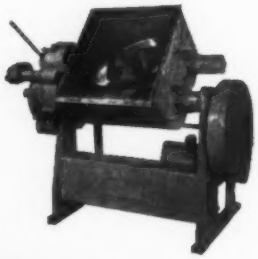

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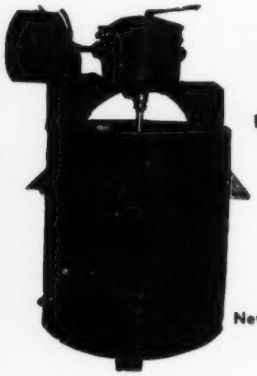

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Salesman Wanted: Major private label manufacturer of soaps and toiletries needs top flight salesman. Handle present accounts and develop new business. Experience and contacts important. Salary plus expenses. Address Box 477, c/o *Soap*.

Wanted: Jobbers and distributors for miniature guest soaps, wrapped and unwrapped. Write for samples and prices to box 476, c/o *Soap*.

Chemist Wanted: Graduate chemist with 2 or more years experience in chemical specialties field, aerosol and some bacteriology desirable. Development work, progressive midwest company, name brand products. Send complete resume. Address Box 464, c/o *Soap*.

Mfr. Representative: For Chicago and/or Chicago-Milwaukee territory, also New Orleans, La. Bulk-sized home laundry detergent sold through appliance, department store, and laundry supply jobbers. Product manufactured and warehoused in Chicago. Address Box 478, c/o *Soap*.

Chemist Wanted: By New Jersey manufacturer of soaps, cleansers and other sanitation maintenance products. To take charge of production, development and control. Practical man with plant experience for busy growing company. Give details education, experience, salary, etc. Address Box 466, c/o *Soap*.

Outstanding Opportunity: Experienced sales manager wanted by national manufacturer of sanitary chemicals for established branch operation in midwest covering extensive area. Salary in 5 figures, plus expenses and over-ride on sales. Apply by letter giving complete resume. All replies confidential. Address Box 465, c/o *Soap*.

Salesman-Manager: Fatty acid salesman-manager or broker, or agent wanted by new East Coast fatty acid producer, large production available. Replies confidential. Address Box 486, c/o *Soap*.

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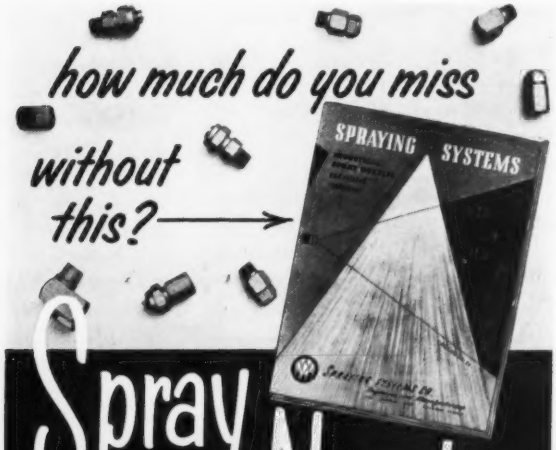
Soapmaker Available: Over 18 years experience in making full boiled settled soap. Supervised soap and glycerine department from raw material to finished powdered soap and crude glycerine. Desires responsible position. Address Box 479, c/o *Soap*.

Chemist—Insecticides: Experienced research chemist in pesticide residues, emulsifiers, wetting agents. Entomological background. MS Cornell 1952. Earlier degrees abroad. Will relocate. Address Box 481, c/o *Soap*.

Soapmaker Available: Over 20 years experience in kettle room operation, boiling laundry and toilet soaps. Address Box 482, c/o *Soap*.

(*Cont'd on Page* 173)



Situations Wanted

Purchasing Agent: 35 years old, married. Have handled all procurement of equipment, materials, and laboratory supplies for chemical specialties firm. Desire more challenging position. Address Box 484, c/o *Soap*.

Research Chemist: Ph.D., 27 years of versatile experience in organic and industrial chemistry, creative, specialized in synthesis of basic detergents, wetting and chelating agents, analysis and formulating of detergent compositions and cleaners. Foreign languages. Publications. Literature search. Presently employed in New Jersey. Desires challenging position in research and development, preferably in surfactant field. Address Box 483, c/o *Soap*.

Development Engineer: Would like to associate with aggressive manufacturer of syndets, specialties, asphalts or other chemicals. Eleven years successful supervisory experience in product and process development, research, evaluation, design, operation, start-ups, trouble-shooting. Presently employed by major producer of detergent intermediates and finished detergents. Address Box 469, c/o *Soap*.

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Now Available: Third edition HANDBOOK OF PEST CONTROL. by Mallis. See page 80.

Miscellaneous

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Soap Plant Wanted: To buy or rent soap plant located in mid or south west for boiled soaps, bar, chips etc. Reply with full particulars, in strict confidence. Address Box 472, c/o *Soap*.

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For Sale: Bowen pilot T-301 SS spray dryers, Sharples #16V inconel soap centrifugals, Hope single piston stainless filler. Perry Equipment Corp., 1410 N. 6th St., Phila. 22, Pa.

For Sale

New Polish Ingredient

(*From Page* 84)

found to be at least as efficient as other acids, conventionally employed in the preparation of stable, bright drying floor waxes. Studies were conducted to determine the comparative emulsification efficiency of various fatty acids in waxes employing the use of vegetable wax, emulsifiable polyethylene, and Fischer Tropsch wax. The new material was found to be superior to currently marketed tall oil fatty acids and was particularly effective in the dispersion of polyethylene wax. This is of interest and importance because of polyethylene's present popularity in light-colored floor polishes and because polyethylene waxes are usually quite difficult to emulsify. In the measurement of particle size in identical dispersions differing only in the type of fatty acids used, dispersions made with the new TOFA exhibited the smallest particle size and the highest bright dry gloss.

Comparison of self-polishing wax preparations containing equal amounts of the new TOFA and of other acids revealed no significant difference in the performance properties. Some superiority in leveling characteristics was, however, assigned to the polishes prepared with the new fatty acid. In addition, because of better emulsification efficiency obtained with the new product, less fatty acid is required. This results in improved soil resistance of the polish.■

Bibliography

1. Bolton, M. E. and Marshall, A. S., Examination of Wax Suspensions by Turbidimetric Methods. *Soap and Sanitary Chemicals,* September 1949.
2. Schoenholz, D. and Kimball, C. S., Electron Microscope Studies, Bright Dry Wax Dispersions. *Soap and Sanitary Chemicals,* August 1947.
3. Test procedure of Federal Specification P-W-155, August 27, 1954. Sections 4. 3. 6. 0-4. 3. 6. 3.
4. Section 4. 3. 5 of the above specification.
5. Gardner, H. A., and Sward, G. G., Physical and Chemical Examination of Paints, Varnishes, Lacquers, and Colors; Tenth Edition, July 1947. Hardness Via Sward Rocker, pp. 164-166.
6. Schoenholz, D. and Burns, G. D., Construction and Operation of Floor Wax Test Floor. Paper presented at 43rd Mid-year Meeting of Chemical Specialties Manufacturers Association.

Detergents in Sewage

(*From Page* 57)

have been due more to the presence of the perfume than to the ABS in view of the findings with ABS alone.

All test panels reported that there was no fishy or oily taste but that the presence of ABS was detected only by a sensation in the mouth. It is obvious from the analytical data presented above on the amount of ABS found in drinking water samples throughout the country, that ABS is never present in sufficient amounts to cause any taste or odor problem. ABS may serve as an indicator that water is being contaminated. Taste and odor problems and health problems arising from contaminat-

ed water are due to the other contaminants.■

Reference

(1) Webster, H. L., and Halliday, J., "Determination of Alkylbenzenesulphonates in River Waters and Sewage," The Analyst, *81*, 552 (1959).

Aerosol Corrosion

(*From Page* 103)

monofluoromethane, and tetrachlorodifluoroethane. The free radical nature of the reaction was confirmed.

References

1. Parmelee, H. M., and Downing, R. C., "Corrosion in Aqueous and Alcoholic Aerosol Systems," *Soap and Sanitary Chemicals* (Special issue, Official Proceedings, CSMA) Vol. XXVI; No. CSMA (*2*)
2. Razuvaev, G. A. et al, *J. Gen. Chem. USSR 23* (1953) p. 1439-41
3. Razuvaev, G. A. and Sorokin, Yu, A., *J. Gen. Chem. USSR 23*, (1953) p. 1589-92
4. Razuvaev, G. A. et al, *J. Gen. Chem. USSR 25*, (1955), p. 463-65
5. Heberling, J. W., and McCormack, W. B., *JACS 78* (1956) p. 5433-35
6. Witjens, P. H., *American Perfumer, 71 #2*, (1959) p. 51, *Aerosol Age*, Vol. 4, #12, December (1959)
7. Walling, C., "Free Radicals in Solutions," John Wiley and Sons, Inc., N. Y., 1957, p. *36*
8. Ibid, p. *294*
9. Ibid, p. 480
10. Ibid, p. 482
11. Ibid, p. *282*
12. Ibid, p. 401, 411

Aerosol Seminar

(*From Page* 73)

fillers include components, according to Mr. Peterson who added that the average contract loader turns over his inventory 18 times a year. The limit where it pays a marketer to install his own captive line is 20,000,000 units, according to Mr. Peterson, who said some harsh words about industrial engineers and unrealistic estimates, when compairing contract and captive filling costs. He pointed to the great investment in space required by warehousing the actual filling operations.

Mr. Beacher reported that Avon combines both systems, uses three captive lines and the services of contract loaders. He said that there was no difference in performance either way. Avon's main reason for captive filling was stringent quality control required in certain cosmetics.

Mr. McGhie was questioned on propane and butane to lower propellant costs. Importance of location and length of supply lines on the one hand and problems of handling these gases in the plant were mentioned. Mr. Peterson reported that these gases could be used to decrease propellant costs without sacrificing safety or product characteristics, if judiciously handled and formulated.

"Where should a novice go for information?" was taken up by Messrs. McGhie, Beach Cannella, and DiGiacomo. Limited advice can be obtained from the container manufacturer, from the valve maker, and from raw materials suppliers. The latter include propellant firms as well as basic suppliers of formulation ingredients. General advice is available from contract fillers.

At the end of the meeting the perennnial question of empty container disposal was aired but no new answers were offered.

Walter Beard remarked that aerosol products are like living beings, gaining and loosing weight, breathing, etc. Their vagaries should be understood, condoned, and remedied in that light.■

★

At PFW for 40 Years

John ter Veer, secretary of Polak's Frutal Works, Inc., Middletown, N. Y., was honored recently upon completion of 40 years with the company. Mr. ter Veer joined P.F.W. in Amersfoort, Holland in 1920 and was transferred to the United States three years later. He was elected secretary in 1928. At a dinner in his honor last month, Mr. ter Veer was presented with a hi-fi set from the board of directors and received other gifts from associates and friends.

Packaging Automotive Specialties

(*From Page* 117)

welcome convenience when faced with changing a flat tire in the hot summer sun.

A relatively untapped field is the replaceable screw-in can or container. Basically, this would require a threaded opening in some part of the car, allowing the purchased can to be screwed in place when its predecessor is exhausted. Thus, the day of automatic car greasing controlled from the dashboard or control of fires under the hood from the same location is foreseeable. A device built into the threaded opening of the car to puncture any inserted can being threaded in would offer a no-spill method of introducing antirust material or antifreeze into the radiator, or some other system.

Dreaming? Maybe! However, it is this *type* of dreaming that will help to develop large volume repeat business direct to the car owner—the consumer.

Lets come back to earth for a moment. Assume one has such a product in a new area and wants a package for it (or even a package for an existing product). What does he do? Presumably he would go to a person or group knowledgeable in the area of packaging and it would offer professional help. If he came to Continental Can, for example, this is what would happen: His goal in merchandising the product would be freely discussed and limits imposed by packaging material technology would be outlined. A check list of what the container must do to satisfy the wholesaler, retailer, and consumer would be itemized with some indication of the priority of each item. Such a list might include:

1. Stacking features;
2. Absence of interaction between product and container;
3. Container should have "X" years shelf life;
4. Container should contain and protect the product;
5. Container should have easy open and reclosure features;
6. Container should carry the product image;
7. Special fittings required such as pouring characteristics;
8. Concise *use* instructions for the consumer.

Once these stipulations have been outlined, the container can be designed. In the case of a can each component must be considered as a potential weak link and steps taken to strengthen it. When a can is completed, points such as these have been considered: Double seam area; side seam area; inside enamel; outside lithography; opening and reclosure problems; effect of headspace (gas or air); reformulation of product; corrosion problems.

Internally, then, any interaction between the product and the can has been controlled by the choice of metal, inside enamel, or the headspace gas composition. An additional tool is available which can estimate the potential corrosiveness of a product to attack a can. This is a useful tool allowing for reformulation of the product where this appears advisable. External attractiveness and protection can be offered by the choice of metal or outside lithography. In many cases, this can be enhanced by wrap-around or complete lithography.

From this quick rundown, you can readily see that metal container design for automotive products utilizes the efforts of the engineer, metallurgist, packaging engineer, chemist, electrochemist and a host of supporting technologies. These all stand ready to help the formulator and aid him in utilizing modern packaging materials to contain his products.

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Geigy Names Jefferson

Raymond J. Jefferson has been appointed sales representative for Geigy Agricultural Chemicals Division of Geigy Chemical Corp..

Ardsley, N. Y., it was announced last month. He will represent the firm in Indiana and Kentucky, making his headquarters in Indianapolis.

Mr. Jefferson has worked as a field man for the New York Farm Bureau and for five years as northeast regional manager for Olin Mathieson Chemical Corp.

Soap Plant Observer

(*From Page* 145)

"In simplest terms, a specification is a precise description of a material; i.e. it should contain a clear and complete description of all the properties necessary for the satisfactory use of the material — nothing else." This opinion was offered by consultant, Wingate Richardson in *Chemical Engineering*, Feb. 1960, pp. 121-126. Mr. Wingate gives us a concise statement of what a specification should be. We would like to add here what a specification should do: It should insure at least an acceptable minimum quality and offer satisfactory protection against inferior quality when purchasing at the most favorable price. You will note that both definitions emphasize the performance concept of a specification rather than the make-up of the product. On the face of it, a specification developed around chemical content or ingredient make-up seems equitable. However, it is by no means dependable, even if an analysis of the material is assured.

Certain ingredients called for in specifications cannot be analytically isolated and identified. Or, if identified, it may not be possible to determine percentage composition without very costly instruments. Furthermore, there are ways of making products that will pass the chemical tests without actually meeting the specification. A cheap product can be compounded that meets all chemical tests of a given specification but fails completely in its performance. It is designed solely for bidding purposes with no regard for its worth as a useful product. However, if purchased and tested, it meets the specification leaving the buyer no recourse.

Some suppliers will gamble on their product not being tested, and will often win the gamble. Many of the chemical tests are time-consuming and complex, and just are not run, even in some of the larger firms. Many small firms buying on a large firm or government specification actually have no way to analyze the material when they get it. They are betting that the supplier won't know whether the material will be analyzed or not; and therefore, the supplier will not take the chance of ignoring the specification. The supplier, on the other hand, can make a safer bet that the buyer won't analyze the product at all

A relatively new approach to specification buying is that of the General Services Administration of the U. S. Government. G.S.A. invites all manufacturers on its list to submit samples of the products upon which they wish to bid for future requirements. As a guide to the manufacturer a general specification is supplied to acquaint him with requirements.

The G.S.A. then carefully and leisurely tests the samples, chemically and by performance, and informs the suppliers if their products pass. Once an item is passed, it gets a special number and the supplier's name is placed on a preferred list. When the government is ready to buy such a product only suppliers whose names are on this list are invited to bid. Bids from other sources are not considered.

In the G.S.A. plan, the prospective bidder pays the cost of having his sample analyzed or tested. He is not required to submit another sample or pay for further tests, unless he alters his product. By this method the buyer knows in advance the standards met by product being quoted. He is assured of adequate quality and can concentrate on getting a favorable price.■

index to advertisers

COMING MEETINGS

American Oil Chemists Society, fall meeting, New Yorker Hotel, New York, Oct. 17-18.

Association of American Soap & Glycerine Producers, 34th annual convention, Waldorf-Astoria Hotel, New York, Jan. 25, 26 and 27, 1961.

Canadian Agricultural Chemicals Association, Britannia Hotel, Lake of Bays, Muskoka, Ont., Sept. 12-14.

Canadian Manufacturers of Chemical Specialties Association, 3rd annual convention, Queen Elizabeth Hotel, Montreal, Oct. 24-26.

Chemical Specialties Manufacturers Association, 47th annual meeting, Hollywood Beach Hotel, Hollywood, Fla., Dec. 3-9.

Chemical Specialties Manufacturers Association, first annual mid-western golf outing, Medinah Country Club, Medinah, Ill., Sept. 20.

Drug, Chemical & Allied Trades Association, 70th annual meeting, Sagamore Hotel, Bolton Landing, N. Y., Sept. 15-18, 1960.

Industrial & Building Sanitation-Maintenance Show and Conference, Sheraton-Cadillac Hotel, Detroit, Oct. 24-27.

International Congress of Surface Activity, Cologne, Germany, Sept. 12-17.

National Agricultural Chemicals Association, annual meeting, Del Coronado Hotel, Coronado, Calif., Sept. 27-29.

National Packaging Exposition and Conference, Exposition Center, Chicogo, April 10-14, 1961.

National Pest Control Association, annual meeting, Hotel Mayo, Tulsa, Okla., Oct. 17-20.

National Sanitary Supply Assn., 38th annual convention, Conrad Hilton Hotel, Chicago, April 23-26, 1961.

Packaging Institute, 22nd seminar, Statler Hilton Hotel, New York, Oct. 31, Nov. 1, 2.

Packaging Machinery Manufacturers Institute, (PMMI) fourth annual show, Cobo Hall, Detroit, Nov. 7-10, 1961.

Society of Cosmetic Chemists, Chicago Chapter, Oct. 11, Nov. 8.

Synthetic Organic Chemical Manufacturers Association, monthly luncheon meeting, Roosevelt Hotel, New York, Sept. 13, Oct. 11, Nov. 10; annual meeting and annual dinner, Dec. 8.

Toilet Goods Association, 26th annual meeting, Waldorf-Astoria Hotel, New York, May 9-10-11, 1961.

tale ends

ADD to that growing list of grandparents the names of Alice and Leonard Oppenheimer of West Chemical Products, Inc., Long Island City. Their daughter, Ellen (Mrs. Don Oasis), gave birth to a fine baby boy, Richard Alan, May 27th. Ellen was on her way to Connecticut College for Women to take her final exams, but the stork intervened and instead Ellen wound up in a maternity ward. Anyway, best wishes to all the Oppenheimers and the Oases(?).

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Al Stepan, Jr., Chicago detergent tycoon, made the headlines in the local paper last month. But not the business pages. This time Al found his way on to the sports pages. The occasion? That happiest of all moments for a golfer: when he makes a hole in one. Al aced the 170 yard 16th hole at Bob O'Link country club in mid-June.

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No longer will the boots of West German soldiers shine like mirrors. A recent order by a German general calls for soldiers to cut their buffing. "Too much polishing also wears out the leather," said the general. Jawohl, say we.

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Among the foreign visitors to the CSMA midyear meeting in May was Max A. Murbach of the Pesticide division of J. R. Geigy, S. A., Basle, Switzerland. Mr. Murbach is in charge of all household chemicals for Geigy.

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None other than our own Don Peck of Fuller Brush Co. showed up (in color, yet) in a spread in the May 7 issue of Saturday Evening Post. Don and his boss, Avard Fuller, president of Fuller Brush, were pictured operating a model railroad in somebody's basement up Hartford, Conn., way. Don and Avard appear to be wearing identical sports shirts, both of which are covered with emblems of various railroads—all in living color.

* * * * *

Four past presidents of the Chemical Specialties Manufacturers Assn. were on hand to pay their last respects to M. M. Marcuse, dean of the sanitary chemical business. Present at the funeral, held June 23 at New York's Temple Emanuel were these former heads of CSMA: Leonard Oppenheimer, secretary of West; H. W. Hamilton, for many years secretary and now executive vice-president of CSMA; Clarence L. Weirich, C. B. Dolge Co., Westport, Conn., and Dr. Emil G. Klarmann, Lehn & Fink Products Co., New York. Also John Powell, publisher of Modern Sanitation and Building Maintenance, for more than a decade treasurer of CSMA.

Besides perfuming your daily newspaper, motion pictures, and even plastic record covers with scents that are supposed to correspond with the music on the record, Fragrance Process Co., New York, is working on a real beaut. The product is a new plastic mousetrap that gives off the aroma of bacon. Fragrance Process claims to have perfected a way of impregnating aromas into such products. Secret of the new process is the use of polyethylene pellets which have been impregnated with a fragrance. The pellets, in turn, are sold to film extruders and injection molders. While this is all very well for plastic flowers that give off just the right floral note, we think a bacon scented mouse trap is real sneaky and not very sporting. Perhaps before the idea goes into production the Humane Society ought to investigate it.

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They're using "frion" to charge "buzz bombs" turned out by a Houston (Tex.) Aerosol Co., according to a recent item in the "Houston Chronicle." The lead paragraph of this report made it sound like the outfit was making weapons the Germans used with such devastating effect against Britain in World War II. Not so, however, gentle reader, actually the firm, which is four months old, is loading insecticides, lubricants and fire extinguishers in pressure packages. To the reporter who wrote the story "Freon" and "frion," and "bug bombs" and "buzz bombs" were all synonymous. Houston Aerosol, which just installed a new piece of equipment that fills 3600 cans an hour, expects to gross $250,000 in its first year, says R. A. Hale, president.

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Hoboken, N. J., residents have a genuine gripe about aerosol products. One night recently three youths in a small car stopped several pedestrians to ask for directions. "When we bent over to tell them, they squirted us in the eye with shaving cream," the victims told police. The cops sent out a radio description of the car and its occupants, one with a cowboy hat, all armed — with shaving cream. If this thing were to keep up it would give aerosols a "white" eye.

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Up to 11 pounds of soap of all kinds may now be mailed to Soviet Russia without a permit when intended for personal use, according to a recent notice in the Canada Official Postal Guide.

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Bill Scheck, of Builders Sheet Metal Works in New York, who has designed and built many different pieces of equipment for filling and testing aerosol products is undertaking a new venture —an automatic pineapple peeler. Seems the natives are tiring of this pastime— and since essential oil houses in the New York area do not employ professional pineapple peelers — the demand has arisen for a machine to do the job.

THERE IS A DOCTOR IN THE HOUSE: His name is Thomas A. Dooley, co-founder of MEDICO, and author of "Deliver Us from Evil." With Dr. Dooley, (left) who spoke at June Ladies' Day luncheon of Cosmetic Industry Buyers & Suppliers Assn. (CIBS), is his assistant, Mrs. G. Sassano, and Lamson Scovill, Scovill Manufacturing Co., president of CIBS.